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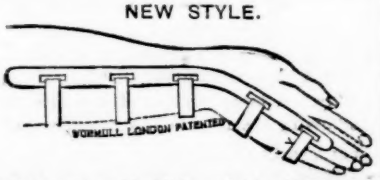

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CONTENTS.

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GOULSTONIAN LECTURES on Paratyphoid Infections. Delivered before the Royal College of Physicians of London by CHARLES HEWITT MILLER, M.D.Camb., F.R.C.P. Lond., Assistant Physician, London Hospital; Physician, Victoria Hospital for Children; late Major (Temp.), R.A.M.C.—Lecture III. 901

ORIGINAL ARTICLES.

Amputations Considered from the Artificial Limb Point of View. By THOMAS OPENSHAW, C.B., C.M.G., M.S. Durh., F.R.C.S.Eng., Lieut.-Col., R.A.M.C.; Consulting Surgeon, Eastern Command; Surgeon to the London Hospital 906

Neurasthenia in Soldiers of the Home Forces. By F. W. BURTON-FANNING, M.D. Cantab., F.R.C.P. Lond., Lieut.-Col., R.A.M.C. (T.). (Report to the Medical Research Committee.) 907

Note on the Treatment of Neuritis. With Special Reference to Sciatica. By HARRINGTON SAINSBURY, M.D.Lond., F.R.C.P. Lond., Physician in Charge of Wards at the Bermondsey Military Hospital, Ladywell 911

Freud's Psychology of the Unconscious. By W. H. R. RIVERS, M.D.Lond., F.R.C.P. Lond., F.R.S., Temporary Captain, R.A.M.C. 912

Salvarsan and Intramine, with Reflections upon Chemo-Therapy. By J. E. R. MCDONAGH, F.R.C.S. Eng., Surgeon, London Lock Hospital, &c. 914

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE: SECTION OF MEDICINE:—Tropical Diseases in the Balkanic Zone 916

ULSTER MEDICAL SOCIETY 917

REVIEWS AND NOTICES OF BOOKS.

Le Traitement des Plaies Infectées. By A. Carrel and G. Dehelly 918

The Treatment of Infected Wounds. By A. Carrel and G. Dehelly. Translation by Herbert Child, Captain, R.A.M.C. (T.V.). With Introduction by Sir Anthony A. Bowlby 918

Treatment of Joint and Muscle Injuries. By W. Rowley Bristow, F.R.C.S. 918

The American Review of Tuberculosis. Vol. I., No. 1 918

Veterinary Review 918

Abstracts of Bacteriology. Vol. I., No. 1 918

LEADING ARTICLES.

THE READJUSTMENT OF CIVILIAN AND MILITARY MEDICAL NEEDS 919

ARRESTED TUBERCULOSIS AND AFTER-CARE FACTORIES 919

HOSPITAL SUNDAY, 1917 920

ANNOTATIONS.

The Croonian Lectures 921

War and Insanity: Lunacy and Mental Deficiency in 1915 922

The Battalion Medical Officer ... 922

Royal Medical Benevolent Fund: An Emergency Appeal 923

An Eskimo Deficiency Disease 923

Technical Optics 923

Chestnuts and Acorns in War Service 924

The "Index-Catalogue" 924

The Physiology of the Pre- and Post-Central and Parietal Convolutions 924

The Metropolitan Water supply 925

URBAN VITAL STATISTICS:

English and Welsh Towns 932

Scotch Towns 932

Irish Towns 932

SPECIAL ARTICLES.

Canada: The War Cripple: Accommodation and Vocational Training 926

The Control of Venereal Diseases: Treatment of Venereal Diseases in Belfast.—The American Journal of Syphilis 926

A Monthly Record of Atmospheric Pollution.—Committee for the Investigation of Atmospheric Pollution: Summary of Reports for the Months ending Dec. 31st, 1916, and Jan. 31st, 1917 932

The Services 933

CORRESPONDENCE.

War Emergency Fund of the Royal Medical Benevolent Fund (Dr. Samuel West, Col. Charters J. Symonds, A.M.S., Major G. Newton Pitt, R.A.M.C. (T.)) 927

The Antiseptic "Flavine" (Acriflavine) (Dr. C. H. Browning) 927

The Lumleian Lectures and Medical Research (Dr. Alexander Morison) 927

Auricular Flutter Discovered by Radioscopy (Dr. Walker Overend) 929

Curious Topographical Names .. 936

Medical Baronetcies (Dr. S. D. Clippingdale) 936

The Salicylic Treatment of Rheumatism (Dr. Richard Cannon) 937

THE WAR.

The Casualty List 930

Deaths among the Sons of Medical Men 930

Mentioned in Despatches 930

Foreign Decorations 930

The Artist at the Front 930

Hospital for Limbless Soldiers 930

Battalion Sanitary Standing Orders (Captain H. W. Bayly, R.A.M.C. (T.), M.R.C.S., L.R.C.P.Lond.) 930

Red Cross Gifts 932

MEDICAL NEWS.

Sidmouth Hospital for Disabled Officers 906

An American Red Cross Scheme 921

The British Women's Hospital Committee 921

The late Dr. C. E. Todd, of Adelaide 933

University of London 933

The Local Government Board of Ireland and Doctors of Military Age 933

Centenarian 933

Royal College of Surgeons in Ireland 933

The Dentists' Register 933

Death of the Inventor of the Simpson Lamp 933

Donations and Bequests 933

Hospital Saturday in Belfast 934

Royal Sanitary Institute (90, Buckingham Palace-road, S.W.) 934

Benn Ulster Eye, Ear, and Throat Hospital, Belfast 934

National Dental Aid Fund 934

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: The Parliamentary Session 934

House of Commons: American Medical Men in France.—Medical Re-examinations.—Sterilised Meat.—Exchange of Prisoners.—The Supply of Flavine.—Medical Examinations for the Army.—Health of Troops in Mesopotamia.—"Manipulative" Surgery.—Medical Arrangements in Mesopotamia 934

Appointments 935

Vacancies 935

Births, Marriages, and Deaths .. 936

Notes, Short Comments, and Answers to Correspondents ... 936

Medical Diary 937

Editorial Notices 937

Manager's Notices 937

Books, &c., received 938

Meteorological Readings 938

Acknowledgments of Communications received 938

FOR INDEX TO ADVERTISEMENTS SEE PAGE 2.

For "BABY WEEK" Arrangements see

MATERNITY AND CHILD WELFARE

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CONTENTS FOR JUNE.

National Baby Week: (1) The Problem of Infant Welfare. By Lady CYNTHIA COLVILLE. (2) A Justification of Baby Week. By Mrs. ANNIE E. BARNES. (3) The Effect of Environment on Child Mortality. By Sir ARTHUR NEWSHOLME.—My Chance of Growing Up.—Atlas and Gazetteer of Maternity and Child Welfare.—Atlas.—Gazetteer.—Cartoon: John Bull Learns Why.—A Great Indictment.—Annotations: A National Training School for District Midwives; The Great Disease Carrier.—The Common Perils of Childhood: (3) The Fly-peril Campaign Reviewed; Cremation the Only Cure. By Major G. HURLSTONE HARDY.—Training and Instruction.—National Baby Week.—Letters to the Editor: Is Ignorance the Chief Contributory Cause of Infant Mortality? A Municipal Service of Midwives.—Books and Journals.—Abstracts and Notes.—Child Welfare Directory.—News and Coming Events.—Questions and Answers.

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INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

ARNOLD:—
Sibley—Treatment of Diseases of the Skin ..... Cover i

BAILLIERE, TINDALL & COX:—
Blair Bell's Gynæcology .. Cover i
Carrel & Dehelly—Treatment of Infected Wounds ..... Cover i
Doyen — Surgical Therapeutics and Operative Technique 7
Fox—Physical Remedies for Disabled Soldiers..... Cover i
Hayes—Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods .... Cover i

BALE, SONS & DANIELSSON:—
Maternity and Child Welfare i

CASSELL & CO.:—
Walker—Surgical Diseases and Injuries of the Genito-Urinary Organs ..... Cover i

DANIEL:—
Rabagliati—Initis or Nutrition and Exercises 4

FISHER UNWIN—
Renson—Mr. Teddy 6
Forgan—Joan Avenel 6
Forster—How to Become a Dispenser 6
Thurlon—Enchantment 6

FROWDE AND HODDER & STOUGHTON:—
Bristow—Treatment of Joint and Muscle Injuries..... 7
Jones—Injuries of Joints 7
McCann—Cancer of the Womb: its Symptoms, Diagnosis, Prognosis, and Treatment .. Cover i
Mackenzie, Sir J.—Principles of Diagnosis and Treatment in Heart Affections 7
Nicoll—Dream Psychology..... 7
Nicoll—Dream Psychology Cover i
Penhallow—Military Surgery .. 7
Porter—Elements of Hygiene and Public Health 7
Riviere — Pneumothorax Treatment of Pulmonary Tuberculosis 7
Stewart & Evans—Nerve Injuries and their Treatment 7

HILTON & CO.:—
Ghosh's Materia Medica..... 6

KIMPTON:—
Roth—Notes on Military Orthopædics ..... Cover i

LEWIS & CO:—
Carter—Elements of Practical Medicine 3
Cooper—Sexual Disabilities of Man 3
Davidson—Localization by X-Rays and Stereoscopy 3
Delorme—War Surgery 3
Gould — Practitioner's Medical Dictionary 3
Gould—A Pocket Medical Dictionary 3
Oliver—Studies in Blood Pressure, Physiological and Clinical 3
Phillips — Amœbiasis and the Dysenteries 3
Rawling—Landmarks and Surface Markings of the Human Body .. 3
Scott—Modern Medicine and Some Modern Remedies 3
Scott—The Road to a Healthy Old Age 3
Shuttleworth and Potts—Mentally-Deficient Children 3
Swanzy's Handbook of Diseases of the Eye and their Treatment .. 3

LONGMANS, GREEN & CO.:—
Watson - Williams—Rhinology Cover i

MEDICAL PUBLISHING CO.:—
Lane, Sir A.—Operative Treatment of Fractures 4

SAUNDERS COMPANY—
Stelwagon—Diseases of Skin Cover i
The Medical Clinics of North America 5

UNIVERSITY PRESS, MANCHESTER:—
Smith & Pear—Shell Shock Cover i

WRIGHT & SONS (BRISTOL):—
Index of Differential Diagnosis of Main Symptoms ..... Cover i
The Medical Annual, 1917 4

MEDICAL LIBRARIES, &c.:—
Baker—Books..... 4
Behnke—Stammering, &c. 4
Evans' Journal 18
Ketley—Stammering 4
Matthews—Wood: Application of Trusses to Hernia 4

OFFICIAL AND GENERAL ANNOUNCEMENTS

ASSISTANCIES, MEDICAL 51

ASYLUMS, HOMES, &c.:—
Ashwood House, Kingswinford .. 46
Barnwood House Hospital 46
Bishopstone House, Bedford..... 45
Brunton House, Lancaster..... 45
Camberwell House, Peckham-road 47
Carew Building, Bodmin..... 49
Clarence Lodge, Clapham Park .. 45
Coltshurst House School, Alderley Edge 49
Copplice, The, Nottingham..... 46
Court Hall, Kenton, near Exeter. 49
Dalrymple House, Rickmansworth 47
Dartmoor Sanatorium 46
David Lewis Colony, Alderley Edge 49
Deff House, Banff 48
Edwards, Leeds..... 49
General Manager, Craven-street.. 49
Ghyllwoods Sanatorium 47
Grove House, Church Stretton .. 46
Grove, The, Catton, Norwich 46
Haydock Lodge, Newton-le-Willows 47
Heigham Hall, Norwich 46
Homes for Inebriate Women 47
Littleton Hall, Brentwood..... 49
London Fever Hospital..... 46
Malling Place, Kent 46
Melbourne House, Leicester 47
Mendip Hills Sanatorium 48

ASYLUMS—(Continued).
Moat House, Tamworth 46
Newmains Retreat, Lanarkshire.. 48
Nordrach-on-Dee, Banchory 48
Northumberland House, Finsbury Park 45
Northwoods House, Winterbourne 47
No. 379, L.O., Strand 49
Peckham House 47
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 49
Plympton House, Plympton 46
Portsmouth Corporation Mental Hospital..... 49
St. Andrew's Hospital, Northampton 46
Shaftesbury House, Formby-by-the-Sea 47
Springfield House Private Asylum, Bedford 45
Stretton House, Church Stretton. 48
The Grange, near Rotherham 48
Vale of Clwyd Sanatorium 46
Warneford Asylum, Oxford 45
Wye House, Buxton 46

FINANCIAL, &c.:—
Equitable Reversionary Interest Society 43

LTH RESORTS, BATHS, &c.:—
Caterham Sanitarium 49
Droitwich Brine Baths 49
Smedley's, Matlock..... 49

HOSPITAL, INFIRMARY, SANATORIUM, &c., VACANCIES.. 49-51

HOUSE & ESTATE AGENTS:—
Davis, Crutched Friars 52
Wright, Sharnbrook 52

LIFE & FIRE ASSURANCES, &c.:—
Medical Sickness & Accident Soc. 38
Prudential 43

MEDICAL ACCOUNTANTS, &c.:—
Turner 52

MEDICAL AGENTS:—
Fieldhall, Limited 53
Manchester Clerical, &c., Assoc.. 53
Medical Agency..... 53
Needes, J. C. 53
Peacock & Hadley 53
Turner 53

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Med. .. 43
St. Mary's Hos. Medical School .. 45
St. Thomas's Hos. Medical School 43
West London Post-Graduate Coll. 43

NURSES' ASSOCIATIONS:—
Co-operation of Temperance Male and Female Nurses 44
Female Nurses Association 44
General Nursing Association 45
Hospital for Sick Children..... 45
London Nurses' Association 44

NURSES' ASSOC. (Continued).
London Temperance Nurses Co-operation 45
Mental Nurses Association 44
Mental Nurses' Co-operation..... 45
New Mental Nurses' Co-operation 45
Nurses' Association 45
Nurses' Co-operation 45
Registered Nurses' Society 45
St. John's House 44
St. Luke's Hospital 44
Temperance Association of Male Nurses, Ltd..... 44
The Retreat, York 44

OFFICIAL NOTICES:—
City of London Lying-in Hospital 43
Dr Jessie Macgregor Prize for Medical Science 43
Guy's Hospital 43
Incorporated Society of Trained Masseuses 43
London School of Tropical Med... 43
Queen Charlotte's Lying-in Hosp. 43
Royal College of Physicians of London 43
York-road General Lying in Hos.. 43

PARTNERSHIPS & PRACTICES. 51

RAILWAY & STEAMSHIP CO.'S.:—
Royal Mail Steam Packet Co. 44

TUTORS & LECTURERS:—
Weymouth 43

TRADE AND MISCELLANEOUS ADVERTISEMENTS

AMBULANCES:—
St. John Ambulance—Invalid Carriages..... 8

BOTTLE MERCHANTS:—
Isaacs 52

CARRIAGES, MOTORS, &c.:—
Armstrong—Liveries 52
Beldam Tyre Co., Ltd.—Beldam Tyres..... 8
Offord & Sons—Ford Cars 8
Singer & Co., Ltd.—Singer "10" Doctor's Car 8

CHEMISTS & DRUGGISTS:—
Allen & Hanburys—Azoule Pituitarin, &c. 20
Bynogen 21
Byno Chrismol, &c. 19
Allenburys Castor Oil 38
Anglo-French Drug Co.—Rhéantine, Hemoplase, &c. 27
Battley & Watts—Battley's Liquors..... 32
Boots Pure Drug Co.—Chloramine-T 12
British Organotherapy Co., Ltd.—Lymphoid Compound 11
British Oxygen Co.—Oxygen..... 38
Browning & Co.—Semprolin Emulsion with Iron..... Cover iii
Burroughs Wellcome & Co.—Kharsivan, &c. 25
Christy & Co.—Ergoapiol..... 40
Clay, Paget & Co.—Glycolactophos 38
Duncan, Flockhart & Co.—Tuberculins, Vaccines 15
Evans Sons Lescher & Webb—Sera, Vaccines, Tuberculins, &c. 18
Fletcher, Fletcher & Co.—Vibrona 29
Ferber Ltd.—Blenosan Capsules.. 41
Gale & Co.—Sugonum, &c. 40
Heppells—Urodonal, Juboi, Globeol, &c. .. 16
Hewlett & Son—Liq. Santal Flav. c. Buchu et Cubebs 38

CHEMISTS—(Continued).
Hoffmann-La Roche Chemical Works—Omnopon..... 24
Hogg & Son—Protein Nerve Food 52
Howards' Pure Bicarbonate of Soda ..... Cover iv
Hudson's Eumenthol Chemical Co.—Eumenthol Tooth Powder. 39
Humphrey Taylor & Co.—Junora..... Cover iii
Maltine Manufacturing Co.—Maltine with Phos. Iron, Quinia, and Strychnia, &c. .. 23
Martindale—Amyl Nitrite Capsules, Sterules, &c. 22
May & Baker—Novarsenobillon .. 11
Menley & James—Bacterol 31
Mertens—Adrenaline Clin, Enesol 28
Moore & Co.—Lymm Pure Salt .. 37
Parke, Davis & Co.—Pituitrin, Hyoscine, &c. 17
Price's Patent Candle Co., Ltd.—Price's Night Lights 39
Raimes & Co.—Slinger's Nutrient Suppositories 37
Richards & Sons—Lactopeptine 30
Tidman's Sea Salt..... 39
Wilcox, Jozeau & Co.—Nativelle's Crystallised Digitaline 40
Riodine 40

DISINFECTANTS:—
Condy's Fluid..... 8
Evans Sons Lescher & Webb—Lysol Evans..... 18
Jeyes' Sanitary Compounds Co.—Jeyes' Fluid, &c. ..... Cover ii
Quibell Bros.—Kerol 41

FOODS.—
Aylesbury Dairy Co.—Humanized Milk 37
Benger's Food 13
Blatchley's Diabetic Preparations 37
Carnrick & Co—Liquid Peptonoids 23
Dry Peptonoids..... 23

FOODS—(Continued).
Freemans Devonshire Custard.... 37
Glaxo 14
Hommel's Hæmatogen 30
Valentine's Meat-Juice 54
Van Houten's Cocoa 37
Vitamogen Ltd.—Vitamogen 31

FURNITURE, &c.:—
Carters—Furniture for Invalids and Hospital Supplies 32

HOSPITALS (ISOLATION):—
Humphreys, Limited—Mobile Hospital Buildings, &c.. 9

MED. & SURG. APPLIANCES:—
Bailey & Son—Invalid Carriages and Chairs for Wounded Soldiers 28
Davis—Lukens Sterile Catgut with Dulox Needle..... 8
Davis & Geck—Sutures fit for Surgery 42
Down Bros.—Barett and Fullerton's Apparatus 35
Hoefticke—Extension Appliances 28
Leslies, Ltd.—Leslies' Zopia ..... Cover ii
Millikin & Lawley—Osteology, &c. 42
Murton—Drop Wrist Appliance.. 34
Robinson & Sons—Gamgee Tissue 8
Seabury & Johnson—Mead's Rubber Adhesive Plaster 35
Timpson & Co.—Reliable Ligatures 42
Whitelaw—Wrist Drop Appliance 33
Foot Drop Appliance..... 33
Wormull—System of Aluminium Splinting ..... Cover i

MINERAL WATERS, &c.:—
Vichy-Célestins 54

OPTICIANS:—
Watson & Sons, Ltd.—Microscopes 42

SANITARY APPLIANCES, &c.:—
Slack & Brownlow—Brownlow Filter 38

STATIONERY, &c.:—
Anderson & Son—Doctors' A/c Forms, &c. 52
Mable, Todd & Co.—Swan Fountpens 6

STOVES, &c.:—
British Commercial Gas Association—Gas-firing 10

TAILORS, BOOTMAKERS, &c.:—
Dowie & Marshall—Hygienic Bootmakers 42
Evans & Co.—Service Uniforms, &c. 42
Harry Hall — Service Dress S.A.M.C. and Navy 52
Hobson & Sons—Officers' Service Dress Outfits 6

VACCINE LYMPH:—
Chaumier's Calf Lymph 6
Renner's Calf Lymph Establishment 6

WINES, BEER, SPIRITS, &c.:—
Humphrey Taylor & Co.— "G. B." Diabetes Whisky Cover iii

X-RAY, &c., APPARATUS:—
Medical Supply Association—Greville's Intensified Induction Transformers 34

MISCELLANEOUS:—
National Health Society—Educated Women wanted 51
No. 52, L.O., Strand—Lady Secretary or Clerk 51
Nurse, Red Lion square 51
Richardson — Case of Surgical Instruments 52

Goulstonian Lectures
ON
PARATYPHOID INFECTIONS.

Delivered before the Royal College of Physicians of London

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LECTURE III.*

MORBID ANATOMY.

THE number of recorded post-mortem examinations is not large and the accounts of various authorities differ considerably.

Stolkind[1] has collected 100 cases from the literature and his own experience. He divides them into six main groups: 1. 12 cases in which the changes were similar to those of typhoid fever. 2. Over 25 cases of acute gastritis and acute gastro-intestinal catarrh. 3. 10 cases with lesions similar to dysentery. 4. 10 cases of transition forms (swollen follicles and Peyer's patches). 5. In many cases the lesions were the same as in septicæmia. 6. In some cases no lesions were found in the gastro-intestinal canal.

Job and Hirtzmann[2] describe two autopsies on patients who had paratyphoid A fever: 1. Intense congestion of the last metre of the ileum; Peyer's patches not altered; mesenteric glands swollen; spleen enlarged, but not friable. 2. Intestines congested; spleen diffluent.

Job and Ballet[3] describe one case of paratyphoid B and three of paratyphoid A: 1. Paratyphoid B, slight swelling of lymphatic tissue of the small intestine; mesenteric glands swollen; spleen enlarged. 2. Paratyphoid A, one ulcerated Peyer's patch; deep ulceration of sigmoid and rectum; mesenteric glands enlarged and swollen; spleen enlarged and diffluent. 3. Paratyphoid A, Peyer's patches a little raised and pink; mesenteric glands swollen. 4. Paratyphoid A, general congestion of small and large intestine and appendix. They conclude that the paratyphoid organisms have little affinity for Peyer's patches.

Sawasaki describes three varieties: 1. A septicæmic type with swelling of mesenteric glands and parenchymatous degeneration of organs. 2. An enteric type, with swelling and ulceration of the lymphatic tissue of the small and large intestine. 3. Dysenteric types.

Dawson and Whittington, in their series of 17 autopsies, found ulceration of the small and large intestine in 7; ulceration of the large intestine in 2; ulceration of the small intestine in 6; there were also ulcers in the appendix in 2 cases. The spleen was mentioned as being large and soft in 4 cases, large and firm in 3, having abscesses in it in 2, normal in 1 case and small in 1. In these series the ulceration of the intestines was more definite and more extensive than in many cases reported.

Rathery in his large series limits his post-mortem observations to the intestines. In the small intestine he found ulceration of Peyer's patches as in typhoid; there was also very great degeneration of the glandular cells of the mucosa. In a convalescent patient there were atrophic changes in the small intestine and scarring of Peyer's patches. In one case there was a hypertrophic condition of the valvulæ conniventes. In the colon ulcers large and small were found and a hypertrophic condition of the mucosa.

From these various accounts it is possible to say that in paratyphoid infections—

1. The lesions may be the same as in typhoid fever.
2. The large intestine is more commonly ulcerated than in typhoid fever.
3. The intestines may be acutely inflamed throughout their length but the lymphatic tissue may escape.
4. There may be no change at all in the intestines.

MORTALITY.

The mortality is difficult to calculate exactly. For practical purposes the mortality in the vaccinated should be kept distinct from that in the unvaccinated. But with such figures as can be obtained it becomes evident that it is a mistake to regard the paratyphoid fevers as being necessarily mild diseases. For example, Rathery had 74 deaths in his series of cases of paratyphoid B fever. This works out at 6·79 per cent. In Osler's series of 1500 typhoid fever patients the mortality was 9·1 per cent. Willcox gives the mortality for paratyphoid in the Mediterranean Force as 3 to 5 per cent.

There are so many varying factors in the collection of statistics of this kind that it would be unwise to dogmatise about them. It is enough to say that paratyphoid fever is a serious disease and is fatal in an appreciable number of cases. According to Rathery the most frequent cause of death is some cardiac complication. But it is not clear whether he includes under this heading toxæmia and asthenia, which other observers agree are common forms of death. Perforation and peritonitis, hæmorrhage and severe pulmonary conditions will account for most of the other fatal cases.

PROGNOSIS.

Briefly, in those protected by inoculation the prognosis is good. In the uninoculated the prognosis is very far from being good. In the first two years of the war paratyphoid fevers were much more severe than typhoid fever. At that time nearly every man was protected by inoculation against typhoid fever, but paratyphoid vaccination had not come into force. It used to be said that paratyphoid B was a mild disease. I do not think that would be said now. Rathery gives a mortality percentage of 6·79 in his large series of paratyphoid B fevers. Percentages, even of a large series such as his, are not trustworthy. I do not think it can be said that paratyphoid A fever is any milder than paratyphoid B. Certainly the paratyphoid A infections from Gallipoli that I have seen were not mild.

In comparing the statistics of mortality in paratyphoid fever with those of typhoid fever it has to be remembered that the latter are based on observations made on the general population, whereas the statistics of paratyphoid mortality are derived from observations made on soldiers. It is known that typhoid fever is more dangerous in women, in the elderly, and in the obese. It would not be surprising if the paratyphoid fevers were also more dangerous in the same manner. The prognosis for paratyphoid fevers in a civilian population would certainly be worse than among soldiers. These considerations emphasise the statement that paratyphoid fevers could be a great danger to the community, greater, perhaps, than is realised at present.

DIAGNOSIS.

The diagnosis should be made by the clinician and the bacteriologist working together. It is possible for the diagnosis to be made on clinical grounds alone, and the type of the infecting organism may be guessed accurately if the case occurs in the neighbourhood of other cases of known bacteriological infection. When, for example, there is an outbreak of paratyphoid B fever, and a patient is seen who has the symptoms of enteric fever, his infecting organism may be correctly named. But this is not diagnosis. The clinician can diagnose enteric fever, but he must turn to the bacteriologist and ask him which member of the group is at work. If the bacteriologist is unable to find any evidence of infection, is the diagnosis to be given up? The answer is an emphatic "No." The bacteriologist has many difficulties to contend with, and these bacilli do not always behave according to the rules laid down for them.

A diagnosis made on good clinical evidence must stand, but it must not be more definite than "enteric fever." Sometimes only negative laboratory results are obtained during the illness. The positive results may then be obtained during convalescence.

(A.) FROM CLINICAL SIGNS.

The clinical signs on which the diagnosis can be made have been described under the various types of the disease that have come under my observation. No matter under what mask the identity of the disease may hide, it is usually discovered as the illness proceeds. The more obviously "enteric" type of signs and symptoms often appear after the initial form of the disease is a week old. In other cases suspicion may be aroused by the atypical behaviour of the patient, and the bacteriologist can then give valuable assistance. But such cases are likely to be overlooked unless there are paratyphoid patients already under observation. A patient may begin a typical lobar pneumonia and later develop spots, an enlarged spleen, and

* Lectures I. and II. were published in THE LANCET, May 19th and June 2nd, 1917.

[1] Stolkind: Proc. R. Soc. Med., Nov. 23rd, 1915.

[2] Job and Hirtzmann: Bulletin et Mém. de Méd. Soc. des Hôpit. de Paris, vol. xxxvii., iii. S.

[3] Job and Ballet: Ibid., xxxix., iii. S.

diarrhœa; or a patient with an inflamed knee-joint may be suspected of gonorrhœa unless similar joints have been recently seen among paratyphoid patients. The enteric group of symptoms and signs may be present or the majority of them may be absent.

The rash, the spleen, the intestinal disturbance are all of importance but not essential. The most important clinical phenomenon is the slow pulse with a rising temperature. Captain H. F. Marris, R.A.M.C., has described an interesting diagnostic point. He has administered a hypodermic dose of atropine, gr. 1/33, to some of these patients. His results show that if the pulse-rate is quickened the infection is not enteric, but if it remains the same or becomes slower the chances are that the infection is of the enteric group.

The spots themselves are not good diagnostic evidence. There are so many possible causes of skin eruptions, especially in soldiers, that great care is needed in deciding their nature. The spleen also is enlarged in so many diseases that by itself an enlargement is of little value. Intestinal disturbances were so common in Gallipoli that a man without diarrhœa was an exception. But a history of a few days' diarrhœa followed by constipation is a very suggestive point.

Differential diagnosis between the two paratyphoids has not been possible except by bacteriological methods. At one time it seemed possible that jaundice might be a special feature of one and not of the other. But this idea had to be given up. Paratyphoid B was the more frequent cause of jaundice in patients coming from France and paratyphoid A in those coming from the Mediterranean area.

Colitis again went through a similar vogue. I am not concerned now with the speculations as to the original cause of colitis in paratyphoid. It is enough to record that the worst and most numerous cases of paratyphoid colitis were paratyphoid A from Gallipoli; on the other hand, in France paratyphoid B is responsible for the bulk of the paratyphoid colitis.

As regards severity there is nothing to choose between the two infections. It would seem that paratyphoid A is over and done with more satisfactorily than paratyphoid B. The latter tends to be more refractory. Also paratyphoid A adheres more closely to the typhoid pattern than does paratyphoid B. But none of these points can be in any way considered diagnostic of one or the other.

(B.) LABORATORY DIAGNOSIS.

I approach this part of the subject with hesitation for bacteriological examinations are outside my province. The methods employed in the laboratory may be briefly enumerated.

1. *Hæmoculture.* This is the best single method of diagnosing a paratyphoid infection. A positive result may be obtained in the early days of the infection. Campbell[4] says that between the second and sixth days is the best period for finding the organism in the blood. The disadvantage is that the patient may not come under observation until the organisms have retired from the blood.

2. Isolation of the organism from the *urine* is a valuable aid when a positive result is obtained. When the result is negative, as it often is, nothing is proved.

3. Isolation of the organism from the *stools* is a more complicated process. The stools in most cases will contain the organism at some period of the disease. Negative results do not in themselves negative the diagnosis. Positive results have to be proved very carefully before they can be accepted. The disadvantages of the examinations of the stools are considerable. There may be organisms present, such as *B. pyocyaneus* and *B. fæcalis alkaligenes*, which make the isolation of the paratyphoid organisms a difficult matter. The fæces may contain so many allied strains of bacilli that an organism may be isolated that is culturally one of the enteric group, but fails to comply with the serological tests. It is not enough to find a culturally positive paratyphoid organism in the stools. The organism should be agglutinable with its own specific antiserum. If it does not agglutinate, it is difficult to know how to decide in the matter of diagnosis. If the patient has clinically enteric fever, and a paratyphoid organism of this type is found in the stools, is it justifiable to say that the patient has paratyphoid fever? It has been found that these inagglutinable bacilli do in some cases agglutinate in the course of time. The bacillus should also be tested with the patient's serum. Sometimes the bacillus agglutinates with the patient's serum, but not with the stock serum. In this case I think it is justifiable to say that the bacillus is the pathogenic organism of the disease from which the patient is suffering, but until it is found to agglutinate with a specific serum it cannot be named.

All these investigations demand time and elaborate methods to differentiate the organisms. It is enough for me if the patient has enteric fever and a culturally positive paratyphoid bacillus is isolated from the stools, for in all probability a definite bacteriological result will eventually be obtained. These organisms are apparently very highly specific, and there may be different strains that give the same cultural tests but differ as regards agglutination.

4. *The Agglutination Tests.*

It is outside the scope of a clinical study to deal with the disputed points with regard to the agglutination reactions of the patient's serum. Looking at the question from without, it is obvious that there are two factors that create difficulties.

First, there are two principal methods of testing the agglutinating power of a patient's serum, the microscopic and the macroscopic. It is said that these two methods may give the same results or they give different results in an examination of the same patient.

Secondly, the agglutinating power of a patient's serum is, of course, greatly affected by protective inoculation. The agglutinins derived from the vaccination persist for a different length of time in different individuals. Some of those who use the microscopic method state that febrile conditions due to other causes, such as sepsis, can alter the agglutinating property of a patient's serum.

Lastly, there are undoubtedly inagglutinable strains of paratyphoid organisms, and strains that do not agglutinate until many subcultures have been made.

A person who has been adequately inoculated within a year should have agglutinins in his serum. An uninoculated person who has contracted an enteric fever should have agglutinins in his serum. To neither of these statements can be added the words "absolutely without exception." What is the value, then, of the agglutination test in adequately inoculated persons in whom an enteric fever is suspected?

Dreyer and Ainley Walker[5] have answered this question very decidedly. They have described their technique of employing exact quantitative methods in performing agglutination tests by means of standardised agglutinable cultures. They claim that their method overcomes the difficulties introduced by protective inoculation.

"All doubtful febrile cases, of however short duration, occurring in inoculated persons require a quantitative determination of their agglutinin titre for typhoid and paratyphoid bacilli on three or more successive occasions at a few days' interval before the presence of typhoid or paratyphoid infection can be excluded."

"The rise and subsequent fall in the agglutinin titre are in many cases so definite that the diagnosis could never be in doubt."

"The maximum agglutinin titre of active typhoid or paratyphoid infection occurs between the sixteenth and twenty-fourth day, most frequently between the eighteenth and twentieth day."

It is claimed for their method that a diagnosis can be made when no means will reveal the nature of the infection. But the results also emphasise the importance of having special wards for the admission of such cases as P.U.O., influenza, and trench fever until their disease can be diagnosed as enteric or not enteric.

But their methods and results have not been universally accepted, and the question is one on which more will have to be heard before it can be considered settled.

C. J. Martin and W. G. D. Upjohn have called attention to a peculiarity that may be observed in the serum of those who have been inoculated against typhoid. In the early days of the disease infection with one of the paratyphoid organisms stimulated the production of typhoid agglutinins only, and it was not until as late as the third to the fifth week that the titre of the infecting organism rose to 1 in 100.

It is probable that further observations by bacteriologists will throw light on this subject of agglutination and its interpretation, but at present the question is not settled and

[4] Campbell: Journal of R.A.M.C., 1911., xxvi.

[5] Dreyer and Ainley Walker: THE LANCET, Sept. 2nd, 1916.

is not ready for dogmatic statements to be made about it. As an aid to diagnosis at a time when the clinician requires help agglutination is not of much value. A phenomenon which is best seen on the twentieth day or later is not as useful as the isolation of the organism from the blood or excreta.

5. *Blood Counts.*

It is possible that a very valuable aid to diagnosis may be obtained from an examination of the cells of the blood, particularly by making a differential count of the white cells. The red cells are usually diminished and the resulting anæmia may be severe. But this anæmia is most pronounced in the later stages of the disease and for many reasons does not give any help in making a diagnosis.

It has been stated frequently, but rather vaguely, that in paratyphoid infections there is a diminution in the total number of white cells with a relative increase in the lymphocytes, and that there is a diminution of eosinophiles in the acute stage followed by an increase during convalescence. It would be of the greatest value if these statements could be made more definite with actual figures to support them. The blood counts should be done periodically all through the illness and convalescence in both inoculated and uninoculated persons.

Walker Hall and Adam[6] have published an account of their observations of differential leucocyte counts in enteric and dysenteric convalescents. Their results are full of promise for this means to become a valuable diagnostic measure. They did not observe the eosinophilia that has been described, but they did not attach much importance to this absence, as it may have been due to the coexistence of an amœbic infection. They observed that there was a greater number of eosinophiles in the blood a few weeks after a triple vaccination (typhoid and paratyphoid) than after a pure typhoid inoculation.

But they found that when agglutinin present in the blood was due to inoculation a normal leucocyte count was obtained, while if the agglutinin was due to infection the typical leucocytosis or polynuclear leucopenia associated with the causal organism would be found.

If a differential leucocyte count will decide whether agglutinins are due to inoculation or infection, many of the bacteriologist's difficulties of diagnosis will be removed. Further, such an examination can be done in a short time and the result known when diagnostic aid is required.

But when all is said and done, it cannot be too strongly insisted upon that for practical purposes, in the acute illness, the diagnosis has to be made on clinical grounds. The bacteriologist may be able to give assistance. But if his results are negative, the clinical diagnosis stands. It is true that it cannot be more close than a diagnosis of the enteric group. But that is enough for treatment and for the prevention of the spread of infection. Even if the clinician has eventually to change his opinion, there will have been less harm done than if a positive paratyphoid patient had not been isolated until the diagnosis was certain.

In the stage of convalescence, in the detection of carriers, and in diagnosing "suspects" the matter is more clearly the province of the bacteriologist.

TREATMENT.

No useful purpose would be served by giving a detailed account of treatment. In the pyrexial stage of enteric fever of paratyphoid origin the usual lines of treatment of typhoid fever should be followed. The following are a few points of treatment based on my cases.

Hydrotherapy in various forms is strongly recommended for high fever, but of all measures of the sort I know of none so efficacious and so little disturbing to the patient as tepid sponging properly carried out. It is the most easily and generally used method of treatment not only for high fever but for restlessness and delirium, for the promotion of sleep, and for improving the general condition of the patient.

As regards general hygiene it is essential that the mouth should have proper attention. Antiseptic alkaline mouth-washes are to be preferred to any other. Those containing glycerine should be avoided. The flow of saliva should be promoted. This can be best accomplished by giving chewing gum and by adding such things as rusks and biscuits to the diet, so that the patient can bite and chew.

[6] Walker Hall and Adam: THE LANCET, Sept. 16th, 1916.

Diet.—I do not consider that a strict milk diet is either essential or desirable. Many adults dislike milk; it is difficult to keep the mouth in good order if nothing but milk is taken, and the curd of milk can make a very tough mass in the intestine in these cases. Variety of diet is greatly to be preferred, and it should be of such a nature that the residue will be neither bulky nor irritating. Solids that are easily digested and leave little residue may be employed with safety—with greater safety in many cases than milk. Meat extracts are valuable in stimulating gastric digestion, but must be avoided when there is diarrhœa. By promoting the salivary and gastric secretions much may be done to nourish the patient safely and satisfactorily. It is most essential that the patient should drink plenty of water; small drinks taken frequently are best. A liberal amount of sugar should be given.

The Bowels.

In the severe cases a simple enema was given regularly whether the bowels were open or not. In milder cases liquid paraffin at night, followed, if necessary, by Epsom salts in the morning, was a satisfactory method of treating constipation. When diarrhœa was troublesome, a regularly given saline wash-out of the colon gave the greatest relief. It could be followed three hours later by a starch enema. At the same time the diet has to be revised, and all possible causes of intestinal irritation removed. Arrowroot flavoured with port satisfied any desire for food, and water in plenty would make up for fluid lost. Distension was treated with enemata, calomel, and pituitrin. It was assumed that peristalsis is less dangerous than stagnation.

In the dysenteric cases, apart from any specific treatment by emetine, the treatment of diarrhœa was difficult. Few of these cases received benefit from the administration of saline purgatives; these measures apparently have their best results at the onset of the illness.

The milder cases were given a mixture of castor-oil and chlorodyne which was found to act satisfactorily. In the severe cases, after trying various methods, I found that opium and astringents acted best. Colon washes with saline or boracic were very beneficial; I found no improvement follow the use of colloidal silver solutions. After the wash a starch enema could be given, especially when a few hours' sleep were necessary.

It was found that in all cases of dysentery after the initial stage, a heaped teaspoon of bismuth carbonate taken in the early morning assisted the recovery. It is very important to prevent a convalescent dysenteric from becoming constipated. Liquid paraffin was invaluable in the later stages of the disease.

Collapse from diarrhœa was treated by the administration of fluid by mouth, by rectum, under the skin, and into the peritoneal cavity. The very slowly given saline injection per rectum is, I think, the most satisfactory method when it can be used. Alcohol is also valuable, and camphor injections are of assistance in an emergency. Strychnine I consider harmful and digitalin useless.

In jaundice the irritation of the skin can be eased by local applications, but particularly by the administration of thyroid extract.

In the stage of convalescence attention has to be paid to the diet and bowels. It is very important that the patient should take active exercise as soon as he feels equal to it.

Intestinal antiseptics were disappointing. Chlorine water, solution of potassium permanganate, β naphthol did not seem to have any effect. Better results were obtained from a proprietary preparation with a phenol basis. It had the effect of deodorising the stools and in some cases banished the infecting organism. But it is impossible to say if the organism was banished permanently The greatest need is for an antiseptic that will disinfect the gall-bladder. It has been said that urotropine has this power, but the statement lacks proof. But as urotropine is of great value in freeing the urinary tract from infection its use might with advantage become more general.

Vaccine Treatment.

I cannot speak from personal experience of any benefit obtained by vaccine treatment, but in the experience of others satisfactory results have been obtained.

Rathery and his colleagues speak very definitely of the results obtained in the treatment of paratyphoid B, which they claim constitute a clear proof of the favourable action

of vaccines. They have obtained positive results, doubtful results, and negative results. The positive results were recognised clinically by an improvement in the patient's general condition, by a lowering of the temperature, by a decrease in the size of the spleen, and by polyuria. The treatment was not used in the early period of the war, during which the cases were more severe; nor was it used in cases of severe asthenia, great splenic enlargement, and coma. But it was used in all other severe cases. They had no accidents or disasters. They give it as their opinion, which is supported by figures, that vaccinotherapy is a useful aid in treatment.

Further observations are necessary before a definite and conclusive statement can be made. But I do not think that anyone would hesitate to say that vaccination has been proved to be more advantageous to the individual as a preventive than a curative measure.

PREVENTIVE INOCULATION.

The question of the value of preventive inoculation can only be decided when all the statistical material has been collected. At the present time it is only possible to give personal opinions and impressions. For my own part, I can be definite about its value. If any evidence were necessary to establish the value of antityphoid inoculation against typhoid fever, the relative fewness and mildness of the cases of typhoid fever in this war would convince all honest-minded men. It has been suggested by Labbé that anti-typhoid inoculation gives a certain measure of protection against the paratyphoid infections. I cannot agree with this suggestion judging from the cases I have seen, and I find that Rathery and his colleagues are very definite in their statement that antityphoid inoculation, even when repeated four times, gives no protection against *B. paratyphosus B.*

Since the triple (T.A.B.) vaccination came into force the number of cases of paratyphoid fever admitted to Netley has decreased appreciably. This feature is of doubtful value, as the Gallipoli campaign has come to an end. But more important is the type of case. It will be admitted that the descriptions of cases and the temperature charts shown indicate that paratyphoid fever can be a very serious disease. In fact, in 1915 it was more often serious than slight. Nowadays it is rare to see a patient with para-typhoid fever who is seriously ill. For six months I have not seen a patient who caused any anxiety. The difference is so great that the enteric wards are now considered the dull part of the hospital, a very great contrast to their condition in the autumn of 1915.

On the other hand, a fair number of men become infected, and though they are not seriously ill they remain in an unsatisfactory, debilitated condition for a long time; but I think that the slowness of the convalescence is attributable as much to the strain of warfare as to the paratyphoid infection. It is noticeable that in all manner of diseases and wounds it takes longer to restore a man to the full vigour of good health than it did in the early days of the war. But this is a complex problem and outside the scope of my subject.

There are two possible disadvantages with regard to para-typhoid inoculation apart from the temporary malaise of the reaction. The first is of great importance and has already been mentioned. The protection of inoculation has so altered the appearance of the disease that it may not be recognised. When one is accustomed to look for a severe condition dangerous to life it is possible that a bad cold in the head will not arrest attention, and yet in the latter other symptoms suggestive of a mild enteric fever may be seen if a proper examination is made. It is probable, then, that one of the results of inoculation will be an increase in the number of undiagnosed mild cases and a proportionate number of undetected carriers.

The second disadvantage is one that will be gladly seized upon by the antivaccinationist. It is possible for a man to have had a very mild attack and remain infected or to be a carrier without any suspicion being raised that he has the infection upon him. If such a man is inoculated he may develop an attack of paratyphoid fever immediately after the inoculation. In the words of the antivaccinationist, the inoculation gave the man the disease, which is quite true as far as it goes; for by lowering the man's resistance for a time the inoculation caused the infection to get the upper hand Such cases have occurred, but they are very rare, and the ill-ness is trivial and runs a short and mild course. In one case, that of an orderly in an enteric ward, one injection of typhoid vaccine was followed by a mild febrile condition, which was found to be paratyphoid B (Chart 1, p. 748).

The duration of the protection given by vaccination varies considerably. Agglutinins may be present in the blood of typhoid-inoculated individuals for many years after inoculation. But in many cases they are on the wane at the end of two years. Paratyphoid vaccination apparently does not give so long a period of protection. Agglutinins begin to disappear at the end of one year or a little later. If agglu-tinins are to be taken as the measure of immunity, it would appear proper to repeat the inoculations every twelve months.

MODES OF CONVEYANCE OF INFECTION.

1. Personal contact seems to be a method by which the infection of paratyphoid is directly spread. Several instances have occurred in my experience that are incapable of explanation in any other way. I have heard also of small epidemics that are attributed to this manner of infec-tion. The infectivity of paratyphoid organisms is greater is this respect than is that of typhoid. Costa[7] has described two small epidemics that were due to direct infection.

The Carrier.—Intermediate Transmitting Agencies.

2. The main source of infection is the carrier. Carriers will be found in any army that takes the field. Carriers have been found in civilian life that have caused repeated local epidemics. More of these have been reported in continental countries than in England.

Torrens and Whittington have remarked that paratyphoid A fever did not appear in France until British troops from India arrived on the Western front. I did not notice any paratyphoid A infections coming from France during the first year of the war. There had been plenty of cases of paratyphoid B fever from France, but the first case of para-typhoid A fever occurred in a wounded man admitted on Oct. 1st, 1915.

Gallipoli produced a large amount of paratyphoid infec-tion. Paratyphoid B fever was at its height on the peninsula in September and October, but in November paratyphoid A was the more common infection.[8] The con-ditions at Gallipoli were such that intestinal diseases were rife, and there was every conceivable condition present to assist the dissemination of infected matter. The carriers played the most important part, assisted by intermediate agents, such as flies, dust, and contaminated water. The conditions of existence were favourable to the propagation of disease, for the men were war-worn, exhausted, cramped in a restricted space, and subjected to bad climatic condi-tions. Sarrailhé and Clunet found that the conditions which favoured the spread of camp jaundice were fatigue, cramping in a confined space, and unfavourable climatic conditions.

The number of intermediate transmitting agencies could be multiplied, but the following have been proved to be of the greatest importance.

1. Flies can spread the disease, both by carrying infected material on their feet, and by ingesting the organisms and passing them out in their excreta. Graham-Smith,[9] in his book "Flies and Disease," writes:—

> The observations which have been quoted show that flies, if suitable opportunities of visiting infected material occur, may carry and distribute organisms of this type for several days. No instances of infection by flies have yet been recorded.

Faichnie[10] in 1909 published the results of experiments which proved that bacteria ingested by the larvæ of flies might be present in the alimentary canal of the adult. He proved this point with regard to *B. typhosus* and *B. para-typhosus A.* The possibility of the contamination of food by flies is so obvious that the part played by the fly in the dissemination of enteric bacilli need not be questioned. Further, good results have followed measures taken by sanitary officers to exterminate flies.

2. Dust can obviously be a method by which infected particles can gain access to the human body. Of the many plagues of Gallipoli, dust-storms were by no means the least.

3. Contaminated water and food will be the final vehicle of infected material to the human subject. Levine and

[7] Costa: Bull. et Mém. de Soc. Méd. des Hôpitaux de Paris, xxxvii., iii. S. [8] Archibald and others: Loc. cit.
[9] Flies and Disease (Non-blood-sucking Flies). Cambridge Public Health Series. 1913. G. S. Graham-Smith.
[10] Journal of R.A.M.C., 1909, xiii., 672.

Eberson [11] have described a small epidemic that was due to the imperfect treatment of milk bottles which had been contaminated by a convalescent paratyphoid patient.

The Problem of the Carrier.

But however numerous are the possible intermediate agents in spreading paratyphoid infection, it has to be remembered that the real cause of infection is the infected human being. In the acute stage of paratyphoid fever precautions are taken to limit the possibilities of dissemination. In the case of the carrier the danger is greater, because it may not be suspected. A carrier may be an individual in perfect health who can mix freely with his fellows. In communities where there is good sanitation and water drainage the dangers of the carrier are lessened. But even in these circumstances epidemics have been traced to an unsuspected carrier. In barracks, camps, and billets the danger from a carrier is greatly increased, and measures have to be taken to prevent the possibility of the contamination of food and water and to protect the individual by raising his resistance to the infection.

The carrier is usually an individual who has had a recognisable attack of enteric fever, but some of the cases are so mild that they are not suspected. These mild cases are the most dangerous from the point of view of the sanitary officer, and they are probably becoming more numerous. Carriers are of different sorts. The majority are those individuals who pass the organisms in their stools. The gall-bladder is commonly a nest for enteric organisms, and there may be periodical discharges of enteric-laden bile into the intestine. Some of these "gall-bladder" carriers have chronic cholecystitis, and they may have recurrent symptoms which may call attention to the nature of their condition. The most dangerous carrier of all is the male urinary carrier. The fæcal carrier may be expected to pass his infective material into a proper latrine whenever it is possible; the urinary carrier will have a much wider range of action.

The carrier is not only dangerous to others, but he is living in danger to himself. At any time he may develop acute symptoms of paratyphoid fever. It only needs some lowering of resistance by fatigue, shock, wounds, gassing, and even inoculation against any infection for the auto-infection to become severe. Such considerations make it impossible to calculate the incubation period of the disease from observations made on troops in the field.

There does not seem to be any time limit for the carrier. In the case of cholecystitis quoted above the patient had contracted his original infection 16 years before, and I have heard of a similar case with a 50 years' interval.

It is difficult to be certain that a patient who has recently had paratyphoid fever is free from infection. There may be many weeks, and even months, in which the examinations of the stools are negative. Thus one convalescent who remained in hospital for the treatment of other conditions had one positive stool on Oct. 7th and another on Feb. 7th; there had been six negative examinations in the interval. On another occasion, during a spell of hot weather, nearly all the convalescents whose stools had been negative for some time had a positive result.

It is obvious that the carrier is one of the most difficult problems of military hygiene. It is certain that when the organisms are found in the excreta a patient is dangerous and must be segregated. But when they are not found, even over a long period, it is not certain that the man is free from infection. Prolonged segregation and repeated examinations are the only measures that can be taken, and they do not give absolute security.

CONCLUSION.

I will conclude by saying that in our campaign against paratyphoid infection we must aim at personal hygiene, good sanitation, preventive inoculation, segregation of carriers, and, on the part of the clinician, early diagnosis.

I wish to acknowledge my indebtedness to the British Red Cross Society for their kindness in permitting me to use the notes on the patients in their hospital. I also desire to thank Surgeon Lieutenant-Colonel Sir Warren Crooke-Lawless, Commandant of the British Red Cross Hospital, Netley, for giving me the opportunity of seeing these patients as well as for many valuable suggestions, and my colleagues, Major H. L. Tidy and Captain H. A. F. Wilson, for their coöperation and assistance.

[11] Journal of Infectious Diseases, 1916, xviii., Levine and Eberson.

AMPUTATIONS CONSIDERED FROM THE ARTIFICIAL LIMB POINT OF VIEW.

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I VENTURE with all diffidence to state my opinions on the relative merits of the various amputations from the artificial limb point of view.

The Upper Extremity.

With regard to the upper extremity, it is possible to fit an artificial limb to any part. One finger or the thumb of the natural hand is more useful than any apparatus. If only the thumb or one finger is left, artificial fingers or an artificial thumb can be fitted, so that the patient has something to which he can oppose the remaining digit.

Amputation of the wrist-joint should not be done if it is at all possible to leave any portion of the hand, for it gives too long a stump for the proper application of an artificial hand. It is necessary to put the artificial wrist-joint at the end of the natural wrist-joint, and this brings the hand too far away from the elbow, and much power is lost.

For officers or patients engaged in clerical pursuits, a new wrist-joint should be made by removal of one and a half inches of the radius and ulna, for to this joint an artificial hand can be fitted, so that the flexion and extension movements are converted into flexion of the interphalangeal joints of the index and middle fingers. This operation shortens the forearm and increases the power of the flexors of the elbow, and replaces the hand as efficiently as is at present possible. The best site for amputation of the forearm is one where the bones are divided at the lower end of the middle third of the forearm, for this gives a powerful useful stump, not too long, and capable of full pronation and supination.

A forearm stump where the ulna measures three-and-a-half to four inches from the tip of the olecranon is often exceedingly difficult to fit with an artificial forearm bucket. The stump repeatedly slips out of the forearm bucket. As the supinator longus, the extensor muscles, and the flexors are useless, these should be removed in order to produce a flat surface upon which the upper and anterior edge of the forearm bucket can rest. This is especially necessary if the forearm muscles are large. If not more than two inches of the ulna (measured from the tip of the olecranon) can be left, the amputation should be performed above the condyles of the humerus.

Amputation at the elbow-joint should never be performed as an operation of election, for it is difficult, though not impossible, to fit an artificial arm to the stump. If it is imperative that the amputation should be through this joint, the condyles must be removed, for if left it is impossible to accurately fit an arm-socket unless it be laced up the whole length of the front, which considerably weakens it.

The best site for amputation of the arm is one between a point one and a half inches above the elbow-joint on the one hand, and three inches below the fold of the axilla on the other, and an endeavour should always be made to divide the humerus between these two points.

It is difficult to fit an artificial limb to a stump which projects only one inch below the fold of the axilla, but it is still more difficult to fit one where the stump does not project at all.

With regard to the shoulder, it is easier to fit an artificial limb to an amputation where the head of the bone has been completely removed than it is to fit one to an amputation through the surgical neck of the humerus. But, in spite of these difficulties, one should always remember that it is possible to fit an artificial limb to any amputation of the upper extremity.

At the shoulder-joint, by means of a moulded leather cap, an artificial arm is adjusted to the body. Considerable space should be allowed between the arm and the chest wall by flattening the inner surface of the arm, so as to facilitate dressing. By adjustable straps and wires, the movements of the opposite shoulder can be utilised to bend the elbow of the artificial arm, and by a similar arrangement, passing round the chest and down the artificial arm to the thumb, the latter can be moved by abducting the opposite arm.

It is interesting to observe that, in spite of the endeavour of the patient to make the utmost use of an artificial arm, nature constantly asserts the usefulness of the remaining member. If the left arm is lost above the elbow there will be a constantly increasing tendency to use the right arm for everything. This is also noticeable to an increasing extent where the right arm has been lost, for the patient will become left-handed and use his left hand more and more wherewith to perform every function.

The Lower Extremity.

Before passing on to a consideration of the amputations for the lower extremity, let me remind you that in all cases, no matter where the site may be, it is essential that the nerve trunks should be cut as short as possible, and that the end of the stump should be covered with a loose movable non-adherent skin-flap.

With regard to the lower extremity, if the amputation has been of the digits and the bone is well covered with the scar on the dorsum, an artificial boot can easily be fitted, and the patient walks well.

A guillotine amputation through the centre of the tarsus should always be looked upon as a temporary measure, to be replaced by a Syme's amputation as soon as the patient has recovered from the effects of the sepsis and can tolerate a further operation.

No skin-grafting of a granulating Chopart gives the least chance of a useful stump. The scar ultimately becomes the lowest part of the foot in consequence of the contraction of the tendo Achillis, and will not bear the weight of the body without ulceration. Months of suppuration have often followed a guillotine amputation performed through the centre of the tarsus. A Syme is ultimutely necessary, and should be resorted to early.

Neither a sub-astragaloid amputation, nor a Pirogoff, gives the most useful foot. In both these amputations the lowest end of the leg is pointed and irregular, the stump is too long, and the artificial foot so narrow as to prevent the ankle-joint being fixed in the artificial foot itself.

A Syme's amputation is the best about the ankle-joint. It should be performed exactly as described by its originator, the malleoli and a layer of the tibia a quarter of an inch thick being removed. This gives room for a joint in the artificial foot itself instead of in the lateral steel supports.

Any amputation through the leg between the ankle-joint (Syme) and a point six inches below the top of the tibia must be looked on as likely to give an unsatisfactory stump, and one which is, therefore, a tentative amputation.

It is permissible in France to perform such an amputation, because it is always doubtful whether the flaps will or will not slough; but such a method gives an unsatisfactory stump which is thinly covered, badly nourished, liable to blueness, anæmia, ulceration, and sinus formation. It is only permissible as a temporary expedient.

The best amputation of the leg is one where the bone is cut four to five inches from the upper edge of the tibia ("seat of election"), where the lower end of the tibia is square, and where it is well covered with healthy movable skin. A patient with such an amputation can carry a considerable part of the weight of his body on the end of the tibia, the remainder being borne by the lateral surface of the tibia and fibula and partly along the surface of the thigh, i.e., the points of purchase of the socket which carries the artificial limb.

After this amputation, with a well-fitting artificial limb, a patient can walk, run, and dance in such a way as to render it absolutely impossible, even for an expert, to decide which leg is artificial.

In this amputation the fibula ought to be cut half an inch shorter than the tibia, otherwise it seems to increase in length and to project. Should, however, the end of the tibia not be well covered with movable skin the weight of the body cannot be borne on the end of the stump, and has to be carried on the lateral surface of the tibia and fibula, the sides of the thigh, and the tuber ischii.

It is imperative that in any amputation at the upper third of the leg the knee-joint should be kept straight, as flexion may render a further amputation necessary, either through the knee-joint, or just above it. If the knee-joint is allowed to become flexed the hamstrings and the posterior ligament contract and shorten, and all these structures, even the posterior ligament, may require division; and even then it may be impossible to straighten the leg, and amputation at or above the knee-joint may be necessary.

Even one inch of the tibia, if well covered on the under-surface, gives a more useful stump than an amputation through or above the knee-joint. Endeavours should always be made to divide the tibia in such a way, and at such a point, as to get a good covering for its cut under-surface. If this is not possible, or if the flaps slough, or if for any reason it is inevitable that there will be a scar over the end of the tibia, it is better to remove the tibia and the patella by some sort of incision similar to that for a Stephen Smith amputation.

In every Stephen Smith amputation the patella ought to be removed, for if left it retracts and forms a wobbling excrescence, which prevents the accurate fitting of a thigh bucket. It is quite easy by means of an accurately fitting leather bucket, fitted with lateral steels jointed opposite the tubercles on the condyles of the femur, to fit an artificial leg to an amputation through the knee-joint. An artificial leg so made and jointed does not cause the projection of the artificial knee beyond that of the normal knee when sitting down, and the gait of a patient wearing such an artificial leg is excellent.

A transcondylar amputation of the femur, if well covered, gives a very good stump, but the edges of the bones should be rounded off, and the periosteum should be pushed up and replaced over the edges of the divided bone. In any amputation above the condyles, up to a point higher than the middle of the femur, the artificial leg should be made with a lacing bucket of leather, not wood. This lacing leather bucket should be made of strong sole leather and should fit accurately to the thigh. The tuber ischii should rest upon its upper edge, so that the patient's weight is transferred to the ground through the tuber ischii and partly through the friction of the skin against the inside of the bucket. As the thigh shrinks the bucket can be tightened in the lacing, doing away with the necessity of having a new bucket fitted or of wearing sometimes as many as a dozen thigh socks.

At or above the middle of the femur every amputation case should be fitted with a pelvic band, which should be accurately moulded to the body before the steel is hardened. It should extend from just below the anterior superior spine on the affected side round the body below the iliac crests to the opposite anterior superior iliac spine. The hip-joint in this pelvic band should be at a point opposite the centre of the great trochanter and half an inch above it. Such a pelvic band prevents the wobbling of the thigh and considerably improves the patient's gait.

Amputations in the upper third of the thigh, where the bone is divided at any point between the small trochanter and two inches below it, give a stump well-nigh impossible to fit with an artificial limb. If more than two inches of bone below the small trochanter cannot be left, then the femur should be divided at the small trochanter or through the great trochanter.

It is easier to fit an artificial limb where the bone has been exarticulated at the hip-joint than it is where the bone has been divided through the great trochanter or at the small trochanter, so that if a long thigh stump cannot be made there need be no hesitation in removing the upper end of the femur, provided, of course, that the condition of the wound as to sepsis and of the patient will allow of this rather more severe proceeding.

SIDMOUTH HOSPITAL FOR DISABLED OFFICERS.—On May 31st the Countess Fortescue opened, at the Sidmouth Baths, a hospital for officers suffering from stiff joints caused by wounds. The treatment will consist of radiant heat, massage, whirlpool and aeration baths, and the use of mechanical appliances. Dr. William Gordon, of Exeter, delivered an address congratulating Sidmouth on taking up a work of real national importance. The use of combined physical methods as an organised system was, he said, due to French initiative, while the efforts of the Balneological Section of the Royal Society of Medicine had resulted in the establishment of centres in this country on the lines of the clinic at the Grand Palais in Paris. Dr. Gordon laid stress on the necessity for early treatment in cases of crippling, the fact having been proved beyond question that great advantage was gained in the massage and manipulation of disabled limbs by the preparatory use of heat.

NEURASTHENIA IN SOLDIERS OF THE HOME FORCES.

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(Report to the Medical Research Committee.)

THIS communication is entirely based on experience gained at the 1st Eastern General Hospital, Cambridge, where I was serving prior to going overseas with my present unit. Its object is to draw attention to the predominance of neurasthenia as a cause of going sick amongst our newly recruited soldiers. I use the term in its widest sense to include disorders of the nervous system which are believed to have no organic basis. No experience that I had gained in civil practice was, to my mind, of more importance than the recognition of the fact that neurasthenia in some shape or form is by far the most common of the ailments for which the doctor is consulted by patients who are up and about and generally following their occupations. Sydenham[1] states that "hysteric disorders constitute one moiety of chronic distempers." Hospital training hardly prepares one for the numerical importance of neurasthenia, nor for the disguises it may assume. I do remember that one of my teachers, Dr. F. T. Roberts, in enumerating the diseases which should be thought of in making a diagnosis of the case before him, was fond of beginning, "Firstly, gentlemen, it may be nothing at all." Equally astonishing as the frequency with which neurasthenia underlies patients' maladies is the fact that in such a large proportion neither they nor their doctors are aware of the true explanation of the symptoms. But the majority of neurasthenics in civil life are keeping at work. I was not prepared, therefore, for the astounding prevalence of neurasthenia in the occupants of beds in a military hospital. The country is suffering an enormous loss of man-power on this account; there is also the great expense of these men's treatment in hospitals, their occupation of precious beds and attention, and there is the moral and physical deterioration of the patient to be thought of. Numbers of my patients have spent far more time in hospitals and convalescent homes than with their units. They are passed from one institution to another, they presently return to their battalions, where they immediately report sick again and are readmitted to hospital. Such a patient was asked: "How long have you been in the Army?" He replied: "Three weeks, sir." "How often have you been in parade?" "Every day, sir—sick parade," he explained. These are not exceptional instances, but they could be multiplied indefinitely and are of daily recurrence at any hospital which admits soldiers from the Home Forces. To a large extent I believe these losses could be prevented.

General Description.

During the last ten months I have had charge of a number of medical beds in the 1st Eastern General Hospital which had carried from time to time between 120 and 180. Into these beds 2240 patients have been admitted in the ten months, of whom 640 came in convoys from overseas and the remaining 1600 were from Home Forces. Out of this last number 509 were thought by me to be suffering from neurasthenia and to be free from any organic disease. It would appear, therefore, that, speaking from an experience of ten months in a Territorial Force Base Hospital, nearly one-third of the admissions into medical wards from Home Forces are for neurasthenia. A large proportion of them realised that they were of a nervous temperament and that this constituted their disability. A larger number were more or less ready to admit that they were nervous, but had not connected their supposed malady with this nervousness.

The remainder of the patients were unwilling to believe that their symptoms were not caused by disease of an organ, and they would not allow that their nerves had troubled them, although I was satisfied of the existence of evidence that they were of neurotic temperament and ailed nothing besides.

With a few exceptions, to whom reference will be made later, they were sure of their unfitness for military service and did not conceal their resentment at being called up. Many produced a treasured note, which certified that they suffered from some physical malady. All of them had the name of some disease ready on their tongues, which had presumably been endorsed by their doctors, civil or military. The doctor has apparently not borne in mind the extreme frequency of the neurotic factor in the production of symptoms and has not taken pains to discover the real source of the ailments. While allowance is made for the responsibility a doctor incurs when he brands a set of symptoms as neurotic, yet it is obvious that the neurasthenic will not begin to get well until he has been persuaded that he is free from any actual disease. This is the first point in treatment. While he is allowed to think that his sensations denote some particular bodily disease his thoughts are centred there and feelings are exaggerated. He is uneasy about his state of health and is persuaded of his unfitness for soldiering.

Though a number of these sufferers from neurasthenia are of average physical development and constitutional vigour, I have met with few whose physique or robustness was beyond the average. If the weight is occasionally excessive it is associated with flabbiness or want of tone. A large proportion are of notably poor physique. Stunted, weedy growth with small chest is common, and some are to be accounted degenerates. A natural lack of constitutional vigour affords excuse for drooping spirits and a sense of comparative unfitness. Supposing that sufficient force of character to disregard this infirmity is not exercised, a vicious circle is established and the physical condition is further lowered by mental disquietude.

This communication only deals with soldiers of the Home Forces, but I should like to allude to the fact that neurasthenia forms a part or the whole of the disability of an astonishing number of men invalided from overseas. A large proportion of those labelled shell shock, D.A.H., rheumatism, and other conditions plainly owe their ailment chiefly to a pre-existing neurotic temperament. Other minor maladies only assume sufficient importance to get the men sent to England, because they are mixed with the neurotic taint. But I have also seen a number of cases of wrecked nerves in men who had previously been above suspicion, and one can well believe that many conditions that have to be borne in the line are calculated to break the stoutest nerves.

Before passing to the enumeration of the symptoms complained of by my patients I would emphasise the point that the neurasthenic individual never confines his account to what might be explained by any one organic disease or by the affection of any one organ. The widespread distribution of his symptoms is the first point in diagnosis. If he makes rheumatic-like pains his chief complaint, he will go on to describe sensations in the head, in the heart, and the general manifestations of the neurotic state.

Bearing in mind the fact that of the patients by whom we are confronted a large proportion will be neurotic, the doctor should not commit himself to the diagnosis of organic disease, supposing there are no objective signs of this, and unless all symptoms present are thus satisfactorily explained. There is something to be said for the method supposed to have been used by an old R.A.M.C. officer. On a sick parade the odd numbers were allowed treatment and the even numbers were returned to duty.

The Story of the Neurasthenic Soldier.

My picture of the neurasthenic is very briefly as follows. In boyhood, perhaps, he began to evince the characteristics of the nervous temperament, and he did not readily accommodate himself to the rough and tumble of school life. Here I would say that although neurasthenia is met with in every social class, very few of my patients had enjoyed the traditional advantage of our old public schools. I am sure that faulty upbringing is to blame in a large proportion. Introspective habits have not been corrected, and they have not been told that their only rule is to play the man. The neurasthenic did not join in games, but he became serious and inclined to be contemplative. He is very often an only son, and parental upbringing has been injudicious. Later the trials of life are not met with philosophic buoyancy, and the mind is constantly occupied by disquieting thoughts. The nervous system becomes over-wrought and over-sensitive, and thus the working of the whole economy is deranged. While the controlling nervous centres are preoccupied and

[1] Allbutt: System of Medicine.

perturbed, it cannot be expected that subservient organs will do their work smoothly. Symptoms can mostly be explained by over-sensitiveness of the nervous system, exaggerated reaction to stimulus and the absence of well-ordered control over the internal organs.

To go on with the story of my neurasthenic soldiers, I have been told again and again that they "have always been obliged to study their healths." In their past lives they had been incapable of any but light or sedentary work. Many of them had felt themselves obliged to abandon one active occupation after another on account of their weakness. A very small proportion of my patients had enlisted voluntarily. Before the date of compulsory service we saw in this hospital nothing to compare with the recent outbreak of neurasthenia. They disagreed with the examining doctor's verdict of "Fit for service," and adduced previous rejections and their private doctor's opinion as to their delicacy.

They start soldiering, then, with the conviction that their strength will not enable them to stand it. They are suddenly thrust into an uncongenial atmosphere, they dislike the work, and find their comrades unsympathetic. It is not surprising that they should be upset at being torn away from their homes and their businesses.

Anything but heart and soul in their military vocation, they are not in the frame of mind to acquiesce in the roughness of the life and in the unwonted physical exercise. Few of them had previously taken hard exercise, so the first march with rifle and pack naturally caused some aching of limbs and other discomforts. Many of them blame their rations for having to go sick, some that they were always unable to endure cold and wet.

A fright put the finishing touch to a number of my patients. After perhaps some amount of questioning, several men confessed that they were afraid of horses. One promising recruit altogether collapsed on hearing his rifle go off. With a few there was at the bottom of their complaints a grievance, such as being ordered to perform menial tasks, or, in the case of officers, failing to get on with their superiors.

But I should like to mention here the fact that my neurasthenics from the ranks have hardly ever complained of inconsiderate treatment from their officers, commissioned or non-commissioned. Whatever finally determined their nervous breakdown, I almost invariably ascertained that they had suffered in a similar manner for years previously.

Symptoms and Signs.

As I have already said, the neurasthenic's symptoms are never limited to one region or to one organ, and there are certain almost universal general symptoms. Weakness, prostration, a feeling of exhaustion, or sudden collapse are invariable, and many of my patients have been sent in on this account alone as suffering from anæmia or some grave constitutional disease.

Want of energy and inability to interest or concentrate themselves are frequent causes of "going sick" amongst those engaged in office work. In contrast to the overseas sufferers from nervous breakdown, none of my patients made insomnia their chief complaint, though sleep was commonly stated to be broken and unrefreshing. As is so typical of the neurasthenic, the morning is always the worst time. These symptoms are all explained by the using up of nerve-force by mental preoccupation. Our minds must be at peace if we are to possess energy and *joie de vivre*. Other symptoms which are common to all neurasthenics, whatever may be their chief complaint, include tremors. These may be shown by the slightest quivering or over-action of the upper lip in speaking, by the rapid vibratory movement of the upper lids when the eyes are closed, or by fine tremors of the extended fingers. These phenomena are of importance because they put the examiner in the nervous track at sight. Violent tremblings and rhythmical contractions of the limbs or whole body are not infrequently seen and in many of my cases have been labelled malarial rigors. These are, of course, only the familiar manifestations of the nervous state of agitation, but patients have told me that when faced with a sudden emergency or call to action their quaking legs have refused to carry them.

Apart from symptoms referable to the heart there are a fairly constant group of vaso-motor phenomena—cold extremities, hot and cold flushes, which are usually described as the feeling of something creeping beneath the skin from the legs to the head, when they reach which giddiness or faintness may ensue. Sweating is a remarkably active function with neurasthenics. Moist palms or soles or steaming body often suggest the diagnosis, and it may amount to literal drenching of the whole body under circumstances of extra mental stress. I have never before seen such large beads of perspiration so covering the whole body as was constantly presented by a case of shell shock. I would here mention that in a neurasthenic patient whose symptoms had only become marked after being buried in the trenches the sweating was always limited to the left side of his face.

A large proportion of my neurasthenics manifested a marked sternal flush and less commonly a heated, suffused appearance of the face.

All my patients either complain of or admit loss of weight. This is of importance, because it seems to lend colour to the idea that they have some physical disease, but it really means nothing more than a wearing of the flesh off the bones from overwrought nerves.

This will be a convenient time to refer to a few signs that I commonly find present on examination. Exaggerated knee-jerks are generally recognised as characteristic of the neurasthenic and can be used to demonstrate to the patient the meaning of nervous over-sensitiveness.

Less generally recognised is a state of the tongue which I find of frequent occurrence. It has exactly the appearance of having been dried as by a cloth, and is thinly sanded or actually coated. Many patients have been treated, because of their tongues, for derangement of the liver or bowels or stomach, when in reality the condition is a nervous one. The old rice ordeal, in which the suspected person's guilt was established by his inability to swallow a mouthful of rice, depends on inhibition of salivary secretion in certain nervous states. These neurasthenics have many complaints to make about their mouths and their tastes. Sometimes the parched state of the tongue causes a characteristic habit in which moistening of the lips or attempts at swallowing are constantly taking place.

I examined most of my patients for the so-called stigmata of functional nervous disease—the concentric contraction of the fields of vision and anæsthesia of particular distribution. In more than half of my tested patients the fields of vision were normal and in those whose fields were contracted the other manifestations of the neurotic state were usually so marked that the test was only of use as confirmation.

Very few of my men were anæsthetic and the areas affected in them were variable—by no means always assuming the glove-and-stocking distribution. The occurrence of any anæsthesia, again, seemed to be confined to the more marked cases and did not help me in the detection of masked neurasthenia. Their pre-occupation of mind makes these people unreliable witnesses for delicate changes of sensation. Moreover, they are very susceptible to suggestion.

Patients' Chief Complaints.

In their order of frequency my patients' chief complaints or the diagnosis with which they arrived in hospital can be considered under the following headings.

Rheumatism.—This is the most common averred cause of disability. Pains in the legs, in the back, and less markedly in the arms are stated to be constant, but to be aggravated by marching. The joints are not necessarily the seat of the pain, and they are free from all swelling and deformity. There is no real limitation of mobility, but the joints are held stiff by obviously voluntary and exaggerated muscular resistance, the patient overdoing contortions of pain when they are passively bent. I should like to speak strongly about the number of these people who have been allowed their rheumatism, who have been ordered expensive treatment and have been sent for long courses of waters and massage and electricity to distant special hospitals. So soon, however, as the patient has been shown that the joints are perfectly free, and when he has been assured that there is nothing but a nervous condition present, it is easy to get these men straight out of bed and walking about the ward. A large number of these men have suffered in the same way before being called up, but in civil life they blamed cold or bad weather for what as soldiers they attribute to marching. A surprising number of these patients claim to have had rheumatic fever in the past. My attention was at once arrested by the frequency, as it would appear, of acute rheumatism in this class. A little scrutiny, however, satisfies me that their

statement cannot be accepted without question. It is elicited that the illness did not particularly affect the joints and that these were probably not swollen, but that the pains were universal, the chest, head, and body being painful. Most neurasthenics have some symptom referable to the heart, and in these people the supposed affection of the heart is connected with the alleged rheumatic fever. In a large number of cases labelled "Disorderly action of the heart" rheumatic fever is stated to have occurred in the past. In my opinion, however, closer scrutiny substantiates the neurotic rather than the rheumatic element.

As I have said, although such patients may claim to be completely incapacitated and are brought into the ward on a stretcher, it is usually particularly easy to get them on to their feet at once and finally dispel the pains.

The same kind of pains may have been called *neuritis*, but there is a complete absence of other symptoms or of signs of nerve inflammation. If such pain happens, for example, to be referred to the region of the sciatic nerve, this can be stretched without characteristically increasing the pain, and no wasting will be discovered. In my own experience careful measurements have helped me more than anything to discriminate between pain of organic and of functional origin. I have often been inclined to make light of a pain complained of in a limb, until my position was saved by the discovery of definite wasting.

Disquietude of mind is by far the most common cause of headache and of backache. A more critical survey of the local and general symptoms, the absence of signs of organic disease, and the manifestation of neurotic indications will usually make it easy to come to a correct conclusion in regard to these people. My point is that the doctor should have prominent in his mind the possibility of his patients' aches and pains being entirely neurotic. A conclusion will be arrived at by finding objective signs of organic disease conspicuously absent, by recognising that all the symptoms cannot be explained by any one organic disease, and that the individual presents manifestations of the nervous temperament. These patients are never easy in their minds, and their overwrought nerves become exaltedly sensitive. In ancient days it was recognised that another nervous state was capable of producing severe pains. Speaking of religious ecstasy, Father Poulain[2] says "the limbs may feel a great fatigue from it," and other ecstatics have "experienced severe pains" in the limbs, the heart, and the throat to such an extent that they were not expected to live. The same sensations are complained of by the neurasthenic soldier, and are equally due to psychic disturbance. A man was admitted to hospital bent down with backache and with painful legs. It was manifest that he was ill at ease, and he confided his grievance. Having originally been a sergeant, on rejoining he found himself a private, and this reduction was allowed to rankle in his mind. On hearing that he had been reinstated in his former position the pains at once vanished and his back became erect.

As a rule it transpires that the subjects of these painful limbs have long been of neurotic temperament, and the trial of a long march concentrates their attention on their limbs and increases their so-called rheumatism.

Gastritis is the term particularly affected by these patients and apparently by their doctors when the stomach is the seat of chief complaint. The name "gastritis" now suggests to me the inference of neurasthenia. I wonder what exact condition the doctor has in his mind when he diagnoses gastritis. Anyhow, the symptoms usually presented by these patients are pains about the stomach or perhaps elsewhere in the abdomen. These are brought on by food—especially by Army rations—and also by marching or by any upset. Tenderness is often exaggerated and mere pinching of the skin may give pain. The patient complains with much insistence of vomiting, which recurs in small quantities which are jealously preserved for the doctor's inspection. Dyspepsia does not present such a picture and the examination of the contents of the neurotic stomach gives no evidence of disease. Flatulence and pyrosis may be complained of and the tongue is furred. Constipation is the rule, but there may be nervous diarrhœa. A little investigation suggests that nervous disturbance is probably at the bottom of everything.

The Heart.

The heart, I should say, was the seat of some sensations in all neurasthenics, whatever may be the main complaint. Pain is complained of and is usually well below the heart, quite away from the common seat of anginal pain. It is generally a more or less continuous sense of discomfort, which is increased by exercise or by excitement. Palpitation, dyspnœa, giddiness, or actual faintings, together with the neurasthenic's general symptoms already described—are, in my opinion, also almost constantly present in all neurasthenics. These are the symptoms comprised by the condition termed "D.A.H." or "Soldier's Heart," which have been studied and described by the observers at the Hampstead Military Hospital.

The majority of my neurasthenics placed dyspnœa in a prominent place among their volunteered symptoms, and all but a very few answered a question about it in the affirmative. I am aware of the very important work that has been done[3] at the Hampstead Hospital on dyspnœa in some of their patients, and of the discovery of chemical changes in the blood. I can only state emphatically that most of my 500 neurasthenic soldiers presented this symptom. I think I can say the same of neurasthenics whom I have seen in civil practice. Certainly, also, my neurasthenic soldiers admit to having experienced all these symptoms of D.A.H. in different degrees before they enlisted. Time has not allowed me to keep more than rough notes and I cannot give detailed percentages. In my cases this would anyhow be difficult, because the same symptoms recurred almost constantly, it only being a matter of their differing in degree. I have observed the same general tendency to increased pulse-frequency in my neurasthenics as studied at the Hampstead Hospital and the same over-ready reaction to exercise and to excitement. Many of my patients appeared to maintain a rate of 100 or even more during all their waking hours, whatever means I took to secure their composure. During sleep, however, this frequency disappeared. I found the subjects of habitually rapid heart action particularly unamenable to treatment. Respirations were also generally quickened and preserved the usual ratio to pulse-frequency. I looked upon these conditions as being due to over-excitability of the cardiac and respiratory nervous centres.

The exclusion of any evidence of enlargement of the heart and the other negative conclusions arrived at by the workers at the Hampstead Hospital, after submitting their patients to examination by experts using every method of precise diagnosis, is most important. My own exclusion of organic affection of the heart was only based on ordinary clinical methods.

Amongst my civilian patients a common complaint has been a sense of inability to draw enough breath into the chest or to get it deep enough. This purely subjective difficulty has not been mentioned by many of my soldiers.

Nothing is more characteristic of the neurasthenic patient, especially where the heart is the seat of the prominent symptoms, than proneness to giddiness or actual fainting. I should say that the exciting cause is much more often emotion than exercise. From the description commonly given by the patient I imagine that the heart's action gets more and more tumultuous and rapid, until a kind of panic seizes him and he loses self-control and even consciousness. The brain cannot work with such a disturbed state of circulation; it is, so to speak, put out of its stride. I am absolutely in accord with Dr. Lewis in thinking that the word "heart" should not be used in the designation of these cases. The whole point is to reassure the patient as to the absolute soundness of this organ. I imagine there is some objection even to keeping them in a special hospital for diseases of the heart, though this objection is outweighed by the opportunity that has been given for the carrying out of the most valuable researches by the Hampstead Hospital staff. Personally, I soon abandoned the term "D.A.H.," and used instead the name "neurasthenia" for the whole class, without specifying from which organ the most prominent sensations arose.

I do not, however, agree with the proposed provisional term of "effort syndrome," because in my experience emotion is a more powerful cause than effort. Many of my soldiers could get no further with their drill than assembling on parade. A striking instance came before me recently in Norwich. A man who had been a gardener was called up

[2] Religion and Modern Psychology. J. Arthur Hill.

[3] Papers and reports by Dr. T. Lewis, Captain Cotton, J. Barcroft, T. R. Milroy, D. Dufton, T. R. Parsons, Major J. C. Meakins, Captains J. Parkinson and E. B. Gunson, Lieutenants J. G. Slade and A. E Drury, in British Medical Journal and Medical Research Committee Reports.

for service. He had been of highly nervous temperament since boyhood and dreaded being taken away from his village home. He fainted on his first parade and was in hospital in Edinburgh for some weeks. He rejoined his unit, fainted again, and was readmitted to hospital, this time for some months. At the end of this time he was invalided out of the Army with a good pension as permanently unfit from disease of the heart. During my examination his pulse-rate varied between 160 and 112 and his respirations between 40 and 28. The case was a distressingly marked one of general nervous perturbation, but it had this exceptional sequel. A few weeks later he wrote to me saying that he felt much better on being persuaded that his heart was sound, and, realising that an error had been made, he had renounced his pension and returned to work. I have now under my care a soldier whose cardiac and other neurotic sensations were tolerable until gas-helmet drill took place. Though there was no chemical in the helmet he felt overcome and fainted. On admission he was tremulous and overstrung, but the prominent symptoms were rapid heart action and respirations, which were increased by walking, but resumed their old ratio within two minutes after exercise. Nor do my observations bear out the theory of infection or toxæmia as the causes of these cardiac symptoms. I have already referred to my impressions as to the importance to be attached to the patient's statement that he has had rheumatic fever.

I grant that many patients are inclined to date their symptoms from some illness, and that of course many diseases do depress all functions, but in most cases evidence can be found of pre-existing nervousness. Further, an equal number of my patients have attributed their symptoms to an operation, which was required for some purely local trouble, such as hernia. An illness or an operation provides a more interesting reason for a breakdown than a fright or an injury to the feelings. And may not the illness which has been accounted the cause of the toxæmia have been in reality another manifestation of the neurasthenia? Undoubtedly the thermotaxic centre is as readily disturbed from nervous agitation as other parts of their mechanism. As regards other poisons, my notes bear out the conclusions of Dr. Lewis and his collaborators in regard to the much-blamed habit of cigarette smoking. Many of my patients who presented the described symptoms to a marked degree belonged to that serious-minded class of persons who eschew all forms of indulgence, except, perhaps, that of being doctored.

Alcohol is certainly productive of a particular type of nerve disturbance, in which remorse perhaps plays a part, but in these cases there is always the probability of some organic damage having occurred.

I have been on the look-out for any indications of thyroidism in these men, but in only two of the whole number was there any enlargement of the thyroid gland. In these two cases, apart from the common symptoms of excited action of the heart, tremors, and nervousness, there was more interference with nutrition and general health than in the typical neurasthenic. Their pulse-rate did not diminish during sleep in the same manner as did that of the neurasthenic. Moreover, though increased pulse-frequency is the rule in neurasthenia, I have notes of several cases with marked cardiac symptoms whose pulse-rates were slow under ordinary circumstances. Like my other cases, exercise produced an enhanced effect on pulse- and respiration-rate, which was recovered from in about three minutes.

Other Complaints.

Lung disease.—A considerable number of my men came labelled "Tuberculosis." Apparently the complaint of pain in the chest, of some difficulty of breathing, or of a streak or two of blood in the phlegm are thought sufficient grounds for mentioning this disease. Then such loss of a little weight and of strength, with a tendency to sweat, as are characteristic of neurasthenia become fastened on as corroborative evidence. Here we can take advantage of an outside verdict from the bacteriologist, instead of being obliged to ask the suspicious patient to take our word for his soundness.

The bladder is frequently the organ thought to be affected. Micturition is said to be frequent, or difficult, or unrestrainable. Backache is often associated with these symptoms. Nocturnal incontinence does not occur, and it is notorious that the complex act of micturition can be easily deranged by nervous states.

The throat is very commonly the seat of a variety of distressing symptoms in neurasthenia, but amongst my soldiers functional aphonia has been the only phenomenon met with as the prominent complaint associated with the throat.

The sexual organs have also been much less frequently involved with the soldiers' neurasthenia than with that of the civilian. With the soldier the organ which happens to be brought into use by his new work is the one that obtrudes itself on his sensations and begins to be surrounded by symptoms of suspected disease. In several of my patients the exacerbation of their neurasthenia could be traced to their consciences pricking them because they had contracted venereal disease.

Prevention.

I will touch very briefly on prevention and treatment, but I do want to call attention to my conviction that a great deal of neurasthenia must be laid to the door of the doctor who fails to make a strictly correct diagnosis and who does not disabuse the patient's mind of his apprehensions about the presence of organic disease. "The next best thing to a good physician is none at all" applies forcibly here. An officer was recently admitted under my care, whose chief complaint was of general weakness and sense of fatigue. He was also liable to giddiness and threatenings of faintness. All these symptoms were confidently stated to be due to weakness of the heart. I found no suggestion of disease about this organ, but a slight overaction of the upper lip in talking and a certain constraint of manner and of expression demonstrated nervous perturbation. Amongst other sources of worry he admitted being concerned about his heart. To my attempts at complete reassurance on this score he objected that nine doctors, including colonels, majors, and civilians, had told him that his heart was affected. As I was unable to convince him we agreed that he should consult a specialist, but, unfortunately, he did not help matters. He satisfied the patient that his heart was free from any suspicion of disease, but he gave him a certificate which stated that there was a particular tendency for the big vessels to become over-filled and drain blood from the brain. So the patient was left his physical infirmity to nurse. Whereas it is my opinion that if he had been assured that nothing ailed him except the effects of worry, he would soon have been relieved of all his symptoms.

In general the prevention of neurasthenia comes within the sphere of education. All social classes are affected, and I think my officers' ward has as large a proportion of neurasthenics as my other wards. But I do think that the class who furnish the greatest number are they whose education has been carried a little farther than that of their general station, but not yet far enough.

> "We knew too much, but not quite enough,
> And so we went to the wall."

The atmosphere of our public schools, in which character and manliness are developed side by side with learning, seems to prevent neurasthenia. A large number of my patients had followed sedentary occupations up to the time of joining, and even those who conscientiously wish to serve their country are over-taxed by being called upon to do strenuous exercise without any training. I am sure there would be fewer breakdowns amongst recruits if they could be better classified and gradually got on to full drill. It is everything with these men to establish self-confidence.

Treatment.—Prognosis.

Treatment seems to me to resolve itself into an attempt to remove from the mind whatever is the disturbing influence. The doctor's first task, therefore, is to gain the patient's confidence and discover the nature of his troubles. A careful physical examination should always be made, and in the large class where fear of some dreadful disease has been preying upon the mind reassurance on this point may be all that is required to give them a good start on the road to recovery. It is well worth the doctor's while to explain how mere loss of peace of mind can bring about each of their symptoms.

In many cases much patience is called for, and, of course, experience helps in the search for the cause. These people seem to go out of their way to delude themselves, and in good faith deny any worry when the existence of such is patent. I am reminded of a soldier who over and over again assured me that he was perfectly happy and easy in his

mind, and I could get no confirmation of my conviction that he was worrying. When it came, however, to his being discharged from the hospital he earnestly pleaded for some furlough. If he went home he could, he said, arrange a favourable sale of some land, which would otherwise mean a heavy loss to him.

Not only can the doctor, in all probability, show the patient that he has been taking the trouble unnecessarily much to heart and inculcate fortitude and equanimity, but he can do more. As Dr. W. H. R. Rivers pointed out to me, the mere unburdening of his soul confers relief on the patient. There may be more than we think in the act of confession.

On exhorting my neurasthenic soldiers to disregard their sensations and stick to their duties, I have often been answered by "I cannot do more than my strength allows." Broadly speaking, occupation is better for these people than rest. So with Colonel J. Griffiths's kind permission, these men were taken for daily and gradually increasing marches by a sergeant. Those who fell out were examined by me at once and it was easy to demonstrate to them their increasing abilities.

I will not attempt to answer the question, "What proportion of these men can be made into soldiers?" Not a few of my confirmed cases were made to see the error of their ways and returned to their units determined to do their bit. But in the case of the majority I cannot believe that real fighters will ever be made of them. The lifelong neurasthenic is not likely to endure cheerfully the privations and hardships of campaigning and will prove more of a nuisance than a help to his regiment. Nor can the neurasthenic be fired with the spirit required in attack and the willingness to make the supreme sacrifice. But there should be plenty of work at home or behind the line of which they are quite capable and which, after a little treatment perhaps, they should perform efficiently.

In conclusion, I must express my indebtedness to the sisters and nurses of my wards at the 1st Eastern General Hospital. Many observations and records were made entirely by them, and the burden of maintaining the right spirit amongst my neurasthenics and finding occupation for them fell entirely on their shoulders.

I have also to thank Dr. L. E. Shore, who had charge of the department for the diagnosis and treatment of nervous diseases and whose ready and skilful help was of the greatest assistance to me. He relieved me of what would otherwise have often been an uncomfortable responsibility when I ventured to exclude an organic disease supposed to be in existence.

NOTE ON

THE TREATMENT OF NEURITIS,

WITH SPECIAL REFERENCE TO SCIATICA.

BY HARRINGTON SAINSBURY, M.D. LOND., F.R.C.P. LOND.,

PHYSICIAN IN CHARGE OF WARDS AT THE BERMONDSEY MILITARY HOSPITAL, LADYWELL.

[THE treatment about to be recorded was recommended to me by Dr. HUGH WINGFIELD, of Welbeck-street. I have endeavoured to induce him to record his experience of its application, but since he has been unwilling to comply, and has suggested that I should undertake this, I have consented; it is, however, his treatment from beginning to end.]

At all times sciatica is apt to be an obstinate affection, so much so that, as one authority has put it, its treatment, or rather its resistance to treatment, has come to be regarded almost as an *opprobrium medicinæ*. It is for this reason that I am anxious to draw attention to Dr. Wingfield's treatment, which in its simplicity of procedure leaves nothing to be desired, and in its effectiveness has been so encouraging thus far that it is to be hoped others will be induced to give it a trial and thus test its efficacy. An additional reason for giving prominence to the method at the present moment will be found in the considerable prevalence of neuralgias and myalgias among our invalided soldiers.

The treatment consists in the direct application of the strong hydrochloric acid of the B.P., in common parlance fuming hydrochloric acid, to the skin, along the line of the inflamed and painful nerve. The acid in question contains 31·79 per cent. of gaseous hydrochloric acid and has a specific gravity of 1·160; in our text-books it is written down as an *escharotic*. That this acid should be capable of safe application to the bare skin will probably come as a great surprise to a good many who, like the writer, had been accustomed to treat it with great respect as a corrosive acid. The *modus operandi* is first to mark out the line of the nerve pain and tenderness as it happens to present itself in the individual. Sir William Gowers describes the areas of pain in sciatica as "usually most intense in certain spots—(1) above the hip-joint, near the posterior iliac spine, (2) at the sciatic notch, (3) about the middle of the thigh, (4) behind the knee, (5) below the head of the fibula, (6) behind the external malleolus, (7) on the back of the foot." These areas are to be selected when present. In general the practice of the writer has been to carry a broad line of application, some 1½ inches across, straight down the back of the thigh from the gluteal fold to the popliteal space; another application of like breadth for about 3 inches behind the head of the fibula along the oblique course of the external popliteal nerve at this spot; lastly, for some 5–6 inches behind the external malleolus directly downwards; and below the malleolus obliquely on to the dorsum of the foot. The extent of the tenderness will guide more or less as to the extent of the application. A wad of cotton-wool, firmly compressed into a knob of the size of the knuckle of the middle finger, is used to suck up the acid, of which about half a drachm to a drachm will be required. The charged wad, grasped by the finger and thumb (previously vaselined [1]), is then carried gently along the line of application above described. The degree of firmness may be increased subsequently if necessary, and the part may be painted two or three times at one sitting if the skin bears the acid well; the first application should be light and single in order to gauge the sensitiveness of the part, and if the integument happens to be thin and delicate it should receive correspondingly light treatment: Dr. Wingfield prefers to apply the acid with a camel-hair brush. A considerable smarting is sometimes complained of; in other cases little more than a tingling or sense of mild heat is felt. After the application a light covering may be thrown over the part till the skin is dry. The smarting soon passes off and the slight redness induced disappears also; no dressing is required. Rarely, in delicate skins, is a papular rash excited; it should be allowed to subside before re-application of the acid. Blistering has not been observed either by Dr. Wingfield or the writer. The treatment may be repeated twice a week if need be, perhaps oftener; it should be continued so long as the pain and tenderness continue. Massage may with advantage supplement the treatment, and particularly if there have been obvious wasting.

In three cases of sciatica recently admitted into the Bermondsey Military Hospital, Ladywell, the results have been striking and greatly appreciated by the patients themselves. Two of these were bad cases of long duration, and in one there was marked wasting of the muscles of the leg and thigh. Dr. Wingfield has had equally good results in sciatica and in the neuritis of other nerves also, and only once, in a case of neuritis of the upper arm, does he recall the occurrence of a troublesome rash, lasting about 14 days; this he attributed to a too free use of the acid. Amongst his cases he records a case of a neuritis of the arm accompanied by an acute eczema which prohibited the use of the acid; in this case he got rid of the eczema by the application of oleum Deelinæ, and having done this was able to apply the acid and cure the neuritis. These cases occurred for the most part in his past practice when physician at Winchester.

How does the acid act? It cannot be by virtue of its acidity—i.e., its power to neutralise alkalinity—for there is no alkali to neutralise on the surface of the skin, and the power of penetration of the integuments by this highly volatile acid, free to evaporate without let or hindrance, must be minimal indeed. Neither can it be due to its power to act as a counter-irritant, thereby deriving blood to the surface (*ubi stimulus ibi affluxus*), and at the same time sending centripetally, for all they are worth, its sensory stimuli, the objections being that the afflux of blood observed is very slight and very transient (the development of a persistent congestion or mild inflammatory state is quite exceptional), and that the actual nerve irritation produced is

[1] This precaution is advisable if one should be applying the acid frequently, otherwise the skin of the finger and thumb tends to resent the repeated irritation

far below that which iodine and other established counter-irritants set up, with such disappointing results in respect of the cure of neuritis.

The explanation we must leave for the present, the point to arrive at now being the establishment, on a large experience, of the clinical value of the acid in the treatment of sciatica in particular and of neuritis in general, and, perhaps, of that nondescript class of complaint, now so prevalent and so troublesome, labelled "myalgia." Some cases of the last-named class—e.g., lumbago and allied painful conditions—have responded encouragingly; but at this stage it would be unwise to make too wide the terms of reference of this remedy: let the *fiat experimentum*, therefore, limit itself to sciatica and other forms of well-defined neuritis. The value of hydrochloric acid in these affections being confirmed, the investigation of the relative value of other members of the group of acids should follow naturally. The group is a large one, so large that perhaps it would be best to proceed next to the congeners of hydrochloric acid—viz., the other halogen compounds, hydrobromic and hydriodic acids. Though, according to the opinion of some, pharmacology be but an alluring madness, let there be "method in't."

Wimpole-street, W.

FREUD'S PSYCHOLOGY OF THE UNCONSCIOUS.[1]

BY W. H. R. RIVERS, M.D. LOND., F.R.C.P. LOND., F.R.S.,
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THE usual course of scientific progress has been well exemplified, though perhaps in an exaggerated form, by the history of the theory of the unconscious put forward by Sigmund Freud, of Vienna. Few scientific theories escape the fate of being pushed by their advocates beyond the positions which they are fitted to hold, with the result that, failing to fulfil the expectations thus aroused, their merits are underestimated or they are even thrust into the limbo reserved for dead hypotheses, only to be rescued therefrom by some later generation. If we are to trust the contemporary medical literature of this country, this fate is now in store for Freud's theory of the unconscious. His views, or perhaps rather their applications, have stirred up such a hotbed of prejudice and misunderstanding that their undoubted merits are in serious danger of being obscured, or even wholly lost to view, in the conflict produced by the extravagance of Freud's adherents and the rancour of their opponents. This paper is an attempt to deal with the subject dispassionately from the point of view of one who has only temporarily been drawn by current events into the neighbourhood of the maelstrom of medical controversy.

Scope of Application of Freud's Theory.

The first point which may be noted is that Freud's theory of the unconscious is of far wider application than the perusal of recent medical literature would suggest. It is true that Freud is a physician and that he was led to his theory of the unconscious by the study of disease, but his theory is one which concerns a universal problem of psychology. If it is true it must be taken into account, not only by the physician, but by the teacher, the politician, the moralist, the sociologist,[2] and every other worker who is concerned with the study of human conduct. Not only does the medical controversialist fail to recognise that he is dealing only with one corner of the subject, but too often he looks on the whole matter entirely from the so-called practical standpoint and judges a theory of universal interest by the consequences which follow the application of the theory in the hands of the more extravagant of its adherents. It is possible, even probable, that the practical application of Freud's theory of the unconscious in the domain of medicine may come to be held as one of its least important aspects, and that it is in other branches of human activity that its importance will in future be greatest. I may perhaps mention here that my own belief in the value of Freud's theory of the unconscious as a guide to the better understanding of human conduct is not so much based on my clinical experience as on general observation of human behaviour, on evidence provided by the experience of my friends, and most of all on the observation of my own mental activity, waking and sleeping.

Unconscious Experience: Individual and Ancestral.

In the mixture of invective and witticism which may pass for a serious contribution to the subject in the medical literature of this country, an objection frequently put forward is that in postulating unconscious mental states Freud is putting together incompatible and contradictory ideas. One possible course is, that those who make this objection should see whether it is not possible to enlarge their conception of the mind, but to those who find this quite impossible a way out of the difficulty may be suggested. It would be an advantage if, instead of speaking of unconscious mental states, we were to speak of unconscious experience. Everyone would acknowledge that adult human beings have been the subjects of a vast body of experience of which they have no manifest memory, which does not enter into their manifest consciousness. Everyone would, I think, also be prepared to acknowledge that this body of unconscious experience influences our thoughts and actions, our feelings and sentiments. When we speak of such unconscious experience, we are keeping within the realm of obvious fact, although we are ignoring the problem concerned with the form in which the experience exists. Whether this unconscious experience is, or is not, to be included within the connotation of mind is largely verbal and depends on the definition of mind which we adopt. Since the science of psychology has until lately been almost exclusively concerned with problems of definition and description, it is natural that such a concept as that of Freud should meet with opposition, because it does not fit immediately into current systems of definition. The matter will perhaps become clearer if we consider the closely related body of experience which we term heredity. This term is only the name we have adopted for ancestral experience. When we discuss whether a given phenomenon, such as a morbid mental state, is due to heredity, what we really mean to discuss is how far the morbid state is the consequence of the experience of the ancestors of the patient. There have been those, such as Hering and Samuel Butler, who have extended the connotation of a psychological term so as to include this ancestral experience, and have regarded heredity as a species of memory. According to the more generally accepted usage this vast body of unconscious experience is not thought of as a whole in psychological terms. There are, however, certain elements in this ancestral experience which psychologists have singled out from the rest and have termed instincts, and they are agreed in holding that instincts form part of the subject matter of psychology. If such unconscious elements derived from ancestral experience are by universal assent included within the scope of the mind, it is rather difficult to understand how it is possible to exclude unconscious experience acquired in the lifetime of the individual. It would be humorous if it were not pathetic, that many of those who object most strongly to Freud's views concerning the rôle of unconscious individual experience in the production of abnormal bodily and mental states should be loudest in the appreciation of the part taken by that ancestral experience for which they use the term, too often the shibboleth, heredity.

Mental Conflict.—Dissociation.—Sexual Experience.

Far more important than the largely verbal question whether the unconscious influences which mould our conduct are or are not to be regarded as constituents of the mind, is the question concerning what distinguishes Freud's theory of the unconscious from other theories which deal with this subject. A favourite statement concerning Freud's theory is that its fundamental idea is mental conflict. Standing out prominently in the system of Freud is the idea of conflict between the mental tendencies of the individual and the traditional code of conduct prescribed by the society to which the individual belongs. This conflict, however, was fully recognised by psychologists long before Freud. If this idea were the chief characteristic of his theory, no great claim for novelty or originality could be advanced. If a writer were to point to conflict as characteristic of human society, few would regard the proposition as either profound or especially illuminating, and the idea of mental conflict is in much the same case. The feature which makes Freud's theory noteworthy is his scheme of the nature of the

[1] A paper read at a meeting of the Edinburgh Pathological Club, March 7th, 1917.

[2] Cf. Sociological Review, 1916, ix., 11.

opponents in the conflict, and of the mechanism by which the conflict is conducted.

Another concept characteristic of Freud's psychology is that of dissociation, but here again the idea is older than Freud, and forms part of systems of psychology very different from his. The special merit of Freud's theory in this respect is that it provides a psychological theory of dissociation, of the factors upon which it depends, and of the processes by which its effects can be overcome. There is much to be said for a view which would regard as the distinctive feature of Freud's system his theory of forgetting. According to the views long current in psychology, forgetting is a passive process which stands in no special need of explanation. According to these older views, experience is remembered in so far as it is frequently repeated and according as it is interesting and arouses emotion, pleasant or unpleasant. It has been frequently recognised, however, that it is forgetting rather than remembering which needs explanation. It is, perhaps, the greatest merit of Freud's theory that it provides us with such an explanation. According to Freud, forgetting—and especially the forgetting of unpleasant experience—is not a passive but an active process, one in which such experience is thrust out of consciousness and kept under control by a mechanism, which by a metaphorical simile Freud has termed the censor. This censorship is supposed to act as a constant guard, only allowing the repressed experience to reach consciousness in sleep, hypnotism, and automatic or other states in which the normal control of the censor is removed or weakened. Even when the censor thus permits the repressed experience to become manifest, the experience is often only allowed to show itself in an indirect and often symbolic manner. It is this belief in a process of active repression of unpleasant experience which is the special characteristic of Freud's theory of the unconscious, and it is his doctrine of the part taken by such repressed experience in the production of bodily and mental disorder which is the leading feature of his theory in its relation to medicine. According to Freud many morbid mental states and many bodily states dependent on mental disturbance are due to a conflict between bodies of repressed experience, now usually called "complexes," and the general personality of the sufferer.

Still more important than nomenclature or theoretical basis as a cause of prejudice and misunderstanding has been the stress which Freud and his followers have laid upon sexual experience as the material of morbid complexes. In his theory Freud uses the term "sexual" with a far wider connotation than is customary, using it to comprise anything which is either directly or indirectly connected with the process of reproduction. His followers, however, and to a large extent Freud himself, have become so engrossed with the cruder side of sexual life that their works might often be taken for contributions to pornography rather than to medicine. In some of Freud's followers this absorption in the sexual has gone to such lengths that perverse tendencies and prurient ideas are scented in every thought, waking or sleeping, of the patients who come under their care. To a certain extent this excess is a reaction from the timidity and prudery of the great mass of the medical profession in relation to sexual matters, and is a kind of protest against the ignorance of this side of life which so often exists. The mistake which is now being made by many is to regard this excess as a necessary part of the Freudian scheme instead of an unfortunate excrescence, probably due in large measure to the social environment in which the theory had its origin. There are even those who are so obsessed by the sexual aspect of Freud's psychology that they regard sexuality as its basic principle and have fallen into a state of mind which wholly blinds them to its merits.

Evidence afforded by the War.

It is a wonderful turn of fate that just as Freud's theory of the unconscious and the method of psycho-analysis founded upon it should be so hotly discussed, there should have occurred events which have produced on an enormous scale just those conditions of paralysis and contracture, phobia and obsession, which the theory was especially designed to explain. Fate would seem to have presented us at the present time with an unexampled opportunity to test the truth of Freud's theory of the unconscious, in so far as it is concerned with the production of mental and functional nervous disorder. At least one redeeming feature of the ills which have resulted from the shocks and strains of the war would have been the opportunity they present of settling many problems concerning the nature and treatment of functional nervous disorders, and thus we might be helped in our endeavours to cope in the future with the similar states which follow the more ordinary strains of our modern civilisation. In my opinion this hope, so far as Freud's theory and the clinical methods founded upon it are concerned, is largely doomed to disappointment and I propose to consider briefly why this should be so. In my own experience, cases arising out of the war which illustrate the Freudian theory directly and obviously have been few and far between. Since the army at the present time would seem to be fairly representative of the whole male population of the country, this failure to discover to any great extent the cases with which the literature of the Freudian school abounds might well be regarded as significant. If my experience is a trustworthy sample, it would seem as if the problem was already well on the way towards settlement. Freud's psychology of the unconscious and the clinical methods founded upon it would seem to be proving themselves inadequate as a means of explaining and treating those disorders for which the theory was originally designed.

There are, however, certain features of the situation which must be taken into account before we should accept any such conclusion. First, it must be noted that, while the proportion of the population from which cases of war-strain are now being drawn is very large, it is not wholly representative, but has been selected, though in a very rough manner, by the medical examination preliminary to enlistment. There is some reason to think that many persons who would be likely to support the Freudian point of view, have for one reason or another escaped inclusion in the Army, or if they have joined are given work which does not expose them to the more severe shocks and strains of warfare. Another and more important reservation depends on the fact that warfare tends to produce states of anxiety and apprehension so deep-seated and far-reaching that they obscure causes of a different kind. Cases arising out of the war do not for this reason furnish satisfactory material whereby to test the truth of the Freudian position. Persons who break down under the strains of ordinary life in whom other states are not hidden by the overpowering emotional conditions arising out of modern warfare provide material which shows far more readily the influence of unconscious factors of the kind which are held to be so important by Freud and his school. Even when these reservations are taken into account, however, there remains singularly little to support the Freudian position in the form in which it is usually presented to us by its advocates. In my experience this is particularly true in regard to the part played by sexual experience in the production of the functional disorders arising out of the war. We now have abundant evidence that those forms of paralysis and contracture, phobia and obsession, which are regarded by Freud and his disciples as pre-eminently the result of repressed sexual tendencies occur freely in persons whose sexual life seems to be wholly normal and commonplace, who seem to have been singularly free from those sexual repressions which are so frequent in modern civilisation, especially among the more leisured classes of the community. It is, of course, obvious that the evidence in this direction, being negative, cannot be conclusive. The point is that while we have over and over again abundant evidence that pathological nervous and mental states are due, it would seem directly, to the shocks and strains of warfare, there is, in my experience, singularly little evidence to show that, even indirectly and as a subsidiary factor, any part has been been taken in the process of causation by conflicts arising out of the activity of repressed sexual complexes. Certainly, if results are any guide, the morbid states disappear without any such complexes having been brought to the surface, while in other cases the morbid states persist in spite of the discovery of definite complexes, sexual or otherwise, going back to times long before the war.

The denial of the validity of Freud's theory of the unconscious in the form currently held by its adherents, as the means of explaining nervous and mental disorders, is, however, something very different from the denial of the validity of this theory altogether. While in my experience instances of the kind which abound in the Freudian literature are rarely met with among the cases arising out of the war, there is hardly a case which this theory does not help us the

better to understand—not a day of clinical experience in which Freud's theory may not be of direct practical use in diagnosis and treatment. The terrifying dreams, the sudden gusts of depression or restlessness, the cases of altered personality amounting often to definite fugues, which are among the most characteristic results of the present war, receive by far their most natural explanation as the result of war experience, which by some pathological process, often assisted later by conscious activity on the part of the patient, has been either dissociated or is in process of undergoing changes which will lead sooner or later to this result. While the results of warfare provide little evidence in favour of the production of functional nervous disorders by the activity of repressed sexual complexes, I believe that they will be found to provide abundant evidence in favour of the validity of Freud's theory of forgetting, which in the earlier part of this paper I have regarded as the most striking and characteristic feature of his psychology.

Line of Treatment to be Adopted.

I do not attempt to deal generally with the practical consequences which must follow, if we accept the view that many of the symptoms which follow the shocks and strains of warfare depend on the repression of painful experience. I am content now to point out one consequence if we accept the position that certain symptoms of war-strain depend on the activity of repressed experiences arising directly out of the war. I believe that I am stating the orthodox view of the medical profession, I am certainly expressing that of the man in the street, if I say that the forgetting of unpleasant experience is held to be the obvious and natural line of procedure. The advice given takes such forms as: "Put it out of your mind," "Try not to think of it." Moreover, if the advice is not successful and the solitude of the night allows the painful thoughts to force themselves on the attention of the patient, hypnotic drugs, hypnoidal suggestion, or perhaps even definite hypnotism are employed to assist the process of driving the painful thoughts below the threshold of consciousness. When hypnotism or hypnoidal suggestion is employed, there is definite danger of producing directly just those states of dissociation which it should be our most vital duty to avoid, while it is a moot question whether the employment of hypnotic drugs does not tend to produce the same effect though in a different and more gradual way.

If the view I have put forward has any validity the proper line of conduct should be the direct opposite of that which is usually taken. Instead of advising repression and assisting it by drugs, suggestion, or hypnotism, we should lead the patient resolutely to face the situation provided by his painful experience. We should point out to him that such experience as that of which he has been the subject can never be thrust wholly out of his life, though it may be possible to put it out of sight and cover it up so that it may seem to have been forgotten. His experience should be talked over in all its bearings. Its good side should be emphasised, for it is characteristic of the painful experience of warfare that it usually has a good or even a noble side, which in his condition of misery the patient does not see at all, or greatly underestimates. By such conversation an emotional experience, which is perhaps tending to become dissociated, may be intellectualised and brought into harmony with the rest of the mental life, or in more technical language, integrated with the normal personality of the sufferer. As a matter of practical experience the relief afforded to a patient by the process of talking over his painful experience, and by the discussion how he can readjust his life to the new conditions, usually gives immediate relief and may be followed by great improvement or even rapid disappearance of his chief symptoms. It is in grave cases in which the painful experience of warfare has come to persons of somewhat neuropathic tendency, liable to the occurrence of dissociation, that this line of treatment is especially useful, but in slighter cases and more normal subjects there is much to be said for encouraging the patient to become familiar with his painful experience instead of treating it by the process of taboo, surrounding it, and assisting the tendency of the patient to surround it, with a halo of mystery. What is rather needed is the encouragement of that kind of familiarity which breeds indifference, if not contempt.

Value of Freud's Theory to Medicine.

I have only dealt superficially with some of the misunderstanding in which Freud's theory of the unconscious has been enveloped, especially in this country, while briefly considering the place which this theory seems destined to take in relation to the vast mass of clinical experience which modern warfare is providing. I must conclude by considering in the most general manner what I hold to be the value of Freud's theory to medicine. Freud's theory of the unconscious should appeal to the physician in that it provides him with a definite working scheme of influences, which he has long known to be active in the causation of mental disorders and of the bodily disorders which are traceable to mental factors. The modern conception of such disorders is that they are not merely the result of some shock or strain, but are the outcome of the whole life-history of those who suffer, that they are the result of the totality of the individual experience of the patient as well as of that ancestral experience which we call heredity. Of this ancestral experience and to a large extent of the individual experience, everyone will acknowledge that it is not accessible to the manifest consciousness of the patient and cannot be learnt from him by the ordinary methods of obtaining the history of the patient and his illness. The great merit of Freud is that he has provided us with a theory of the mechanism by which this experience, not readily and directly accessible to consciousness, produces its effects, while he and his followers have devised clinical methods by which these hidden factors in the causation of disease may be brought to light. For the physician who is not content to walk in the old ruts when in the presence of the greatest afflictions which can befall mankind, Freud has provided a working scheme of diagnosis and therapeutics to aid him in his attempts to discover the causes of mental disorder and to find means by which it may be remedied. My own standpoint is that Freud's psychology of the unconscious provides a consistent working hypothesis to aid us in our attempts to discover the rôle of unconscious experience in the production of disease. To me it is only such an hypothesis, designed like all hypotheses, to stimulate inquiry and help us in our practice while we are groping our way towards the truth concerning the nature of mental disorder. We can be confident that the scheme as it stands before us now is only the partial truth and will suffer many modifications with further research, but that it takes us some way in the direction of the truth seems to me certain. If this value of Freud's theory were only a probability, or even only a possibility, are we justified in ignoring it as an instrument for the better understanding of disorders of which at present we know so little? Are we to reject a helping hand with contumely because it sometimes leads us to discover unpleasant aspects of human nature and because it comes from Vienna?

SALVARSAN AND INTRAMINE, WITH REFLECTIONS UPON CHEMO-THERAPY.

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IN my Hunterian lectures last year[1] I advanced the theory that the arsenic in salvarsan did not attack the parasites directly, but only indirectly by increasing the oxidising action of the protein particles in the serum and in the plasma cells. I also suggested that metals in general acted as oxidising agents, and that non-metals acted as reducing agents. As we had no powerful reducing drug analogous to salvarsan, I introduced a sulphur compound, and intramine, the name by which this sulphur compound goes, completed the chemo-therapeutic programme. I also showed to the best of my ability that the reason why chemo-therapeutic agents were more potent in protozoal diseases, and especially in syphilis, was due to the increased size and number of the protein particles, which circulate in the serum, forming the resisting substance of the host, or, as it is commonly called, the antibody. If it was proved that arsenic was not essential, it would be right to supplant it by another and less toxic metal.

In certain quarters what may be called the intensive arsenical treatment is now in vogue. Several injections up to 11 or more of the arsenical substitutes for salvarsan are prescribed and followed by an equal number of injections of mercury. The efficiency of such a treatment is judged by the negative

[1] THE LANCET, May 13th (p. 981) and 20th (p. 1025), 1916.

Wassermann reaction which is obtained at the end of it. As the Wassermann reaction is a purely physical reaction (surface-tension), depending upon the number and size of the protein particles in the serum; and as the administration of colloids, if continued long enough, sends many of these particles into solution, thereby making the reaction negative; and as the action of colloids is not a direct one on the parasites, it can readily be seen that a negative Wassermann reaction can give no indication as to whether any parasites are left behind or not. What light does clinical knowledge throw on the subject? Cases treated in this way may develop cerebro-spinal syphilis within two months of the cessation of treatment, and they are, to my own knowledge, gained in hospital and private practice, not few. Other cases may develop severe systemic syphilitic recurrences within the year. In both these classes of cases symptoms of the recurrence are present for some weeks before the Wassermann reaction becomes positive. In many of the cases which present no clinical manifestations the Wassermann reaction becomes positive within a year. Therefore the intensive arsenical treatment does not cure syphilis, and it may leave the patient in a worse condition than he was in at first.

I will now cite three cases out of the large number which have come under my eye, to illustrate what has just been said.

CASE 1.—In August, 1914, a patient had a single primary sore on the prepuce. He was treated with five intravenous injections of galyl, and with intramuscular injections of mercury for six months. In April, 1916, a pseudo-chancre appeared on the prepuce, close to where the original sore had been. The patient then had 11 intravenous injections of kharsivan, and 12 intramuscular injections of mercury. The sore just healed as the eleventh injection of kharsivan was given. In January, 1917, two pseudo-chancres appeared on the skin of the penis. I injected collosol iodine intravenously, and 5·0 c.c. of intramine intramuscularly, with the result that in a week's time the sores had completely healed and the induration accompanying them had disappeared.

CASE 2.—A patient came for treatment when the rash had only just entered the macular stage. He received nine intravenous injections of galyl, and three courses of mercurial injections. Before finishing the third course a large gumma appeared on the back and another on the abdomen. The Wassermann reaction was negative, as it usually is in such cases. Five more injections of galyl were prescribed, without any effect whatever; within ten days, after one injection of intramine, both gummata had completely healed, and the patient felt better than he had done for months.

CASE 3.—The patient, a man, aged 32, had a primary sore on the prepuce and had just entered the generalisation stage when treatment was commenced in June, 1916. The treatment consisted of 11 intravenous injections of kharsivan and seven intramuscular injections of mercury, which ended in August, 1916. Two months later the patient developed bad headaches and unsteadiness of gait. He soon became deaf in the left ear and had double vision. The pupils were unequal, the bilateral discs were choked, and there was paresis of the left auditory and oculo-motor nerves—due to basilar meningitis. The reflexes of the upper extremities were exaggerated; in the lower extremities they were unequal and diminished. Romberg's sign was present, the patient had pains down one leg, and had lost all sexual desire—due to a meningo-myelitis. An examination of the cerebro-spinal fluid revealed the following: Pressure raised; positive lympho-cytosis, 650 cells per c.mm.; albumin and globulin increased; Wassermann reaction positive. From October, 1916, until the above examination was made, in January, 1917, the Wassermann reaction of the blood was negative (tested three times). Under colloidal iodine, colloidal mercury, and intramine injected intravenously and intra-spinally (prepared serum) the patient recovered.

From the foregoing three cases, which are illustrative of many others, the following statements may be made. If the patient is in the primary stage and treated with oxidising agents only, should a recurrence appear it is most likely to simulate a chancre. If the patient has entered the generalisation stage then the recurrence, if systemic, will be a gumma, and if nervous it will be one of cerebro-spinal meningitis. These three cases show that the parasites are not attacked by the drugs directly; that the continued use of oxidising agents is injurious to the patient, as evidenced by the rapidity with which symptoms disappear when a reducing agent like intramine is prescribed; and that arsenic should be eliminated as far as possible from the treatment, as evidenced by the damage it exerts upon nerve and vascular tissue.

The processes of oxidation and reduction *in corpore* are regulated by iron and sulphur respectively, and as sulphur in the form of intramine has proved so successful, not only in hastening the disappearance of the syphilitic lesions, but also in reducing the number of the arsenical injections by half, I have attempted to prepare an iron compound analogous to it, which would supplant arsenic altogether, but up to now not with complete success.

Bearing in mind that the activity of a metal is largely dependent upon its atomic weight, and that mercury has been used for so many years in the treatment of syphilis, without producing worse toxic symptoms than stomatitis, gingivitis, and diarrhœa, it occurred to me that used in a colloidal state better therapeutic results would be obtained than were possible with arsenical compounds. It was a question as to whether the advantage given by the higher atomic weight of the mercury would more or less balance the advantage given by the amino groups in the arsenical compounds. Complex amino compounds of mercury are too toxic. Practical experience soon showed that the syphilitic symptoms disappear very much quicker under colloidal mercury than under salvarsan; roughly speaking, I should say that a full dose of colloidal mercury is more powerful than three full doses of salvarsan. The colloidal mercury, as it is now prepared at the Crookes' laboratories, is supplied as a 1 per cent. emulsion, ready for injecting. The dose is from 5·0 to 15·0 c.c., and the drug can be injected intravenously to out-patients without causing more than a little abdominal pain, diarrhœa, and tender gums, which usually disappear within 24 hours, or immediately after an intravenous injection of intramine. The tenderness of the gums begins to vanish while the patient is on the table.

When I first used colloidal mercury I employed too big doses and nearly had some fatal results, but fortunately the incidents proved instructive.

CASE 4.—The patient had a primary sore on the skin of the penis, general adenitis, and was more or less covered with a follicular syphilitic eruption. I injected intravenously 10·0 c.c. of a 5 per cent. emulsion of colloidal mercury. In the quantity injected there was 0·5 gramme of colloidal mercury, the action of which would be very much greater than 0·5 gramme of ordinary mercury. On the following day the patient had severe abdominal pain and diarrhœa. The diarrhœa increased, and blood was passed per rectum. This continued for a week, during which time not a drop of urine was passed. On the second day severe stomatitis set in, which became gangrenous a few days later. The patient also had hæmorrhagic conjunctivitis, herpes oris, looked and was desperately ill, and I had fears that he might die. This was a typical case of acute mercurial poisoning, and the mercury was acting as a poison in virtue of its oxidising power. This being the case, it struck me that the administration of an equally powerful reducing agent might cure the condition. I injected 100·0 c.c. of colloidal iodine intravenously, and 5·0 c.c. of intramine intramuscularly. Within 48 hours the diarrhœa ceased, and the patient passed nearly his full amount of urine. The condition improved so much from day to day that, with no other treatment whatever, he was perfectly well 18 days later, when there was no albumin in the urine and every syphilitic symptom had vanished.

Another patient received 10·0 c.c. of the same preparation intravenously the same day, having already had 10·0 c.c. injected intramuscularly three days previously. Therefore the patient had 1·0 gramme of colloidal mercury in his system. This patient had exactly the same symptoms as above described, and recovered in the same rapid way after an intravenous injection of colloidal iodine, and an intramuscular injection of intramine. I have had three other cases in which the symptoms were not so marked, smaller doses having been prescribed, which improved at once with one injection of intramine. In all these five cases the syphilitic manifestations disappeared in a few days, and some of the lesions were such as would not have vanished with six or more injections of salvarsan. The urine in these cases has been tested several times since, and has always been free from albumin.

Having obtained such accidental success with intramine in cases of mercurialism, I wondered whether the symptoms of arsenical intoxication would disappear as rapidly after its use. The following interesting case will show that intramine is also a specific for arsenical poisoning.

CASE 5.—A woman suffering from cerebro-spinal syphilis had six injections of galyl, three intraspinal injections, and then she took mercury internally for nine months. The last galyl injection produced an arsenical dermatitis which, in spite of treatment, persisted for nine months, when the cerebro-spinal symptoms reappeared. Within three days after an intravenous injection of colloidal iodine and an intramuscular injection of intramine the dermatitis had practically vanished.

These cases of metallic poisoning being remedied by a non-metallic drug like intramine, not only supports my theory of oxidation and reduction, but also explains why iodine should be useful in cases of plumbism. Doubtless intramine in cases of lead poisoning would be more valuable still. The reader will probably have noticed that whenever an injection of intramine has been prescribed it has been preceded by an injection of colloidal iodine. This is done because iodine is readily taken up by the mercaptan group, which is formed on the breaking down of the intramine molecule, thereby preventing the mercaptan group from exhibiting its affinity for oxygen, which, if allowed to do so, would diminish the effect of the intramine.

Realising the close similarity between arsenical dermatitis and other chronic eczematous skin eruptions, it struck me that the inflammation in some of the latter cases might be due to poisons having too powerful an oxidising or too powerful a reducing action. The following case will show the truth of such a contention.

CASE 6.—A woman consulted me for a chronic dermatitis of the arms and legs, which had persisted for five years and had yielded neither to ointments nor to X rays, &c. As the eruption was patchy and had persisted for so long, I thought the diagnosis of mycosis fungoides was possible. The patient also suffered from asthma, which I have noticed not infrequently accompanies chronic dermatitis, and as I believe this kind of asthma is due to an upset of the normal hydrogen ion concentration of the serum, hence affecting the oxidase-reducase system as well, I thought it possible that treatment along the lines indicated would prove successful. I gave large doses of strychnine, iron, and arsenic internally for three weeks, then an intravenous injection of colloidal iodine and an intramuscular injection of intramine, continuing the iodine treatment internally for three weeks more. The result was that the dermatitis vanished and the asthma disappeared also.

Being strongly of the opinion that intramine, colloidal mercury, and salvarsan, do not kill the parasites directly, but only increase the action of the oxidase-reducase system of the protein particles in the serum, it struck me that their combined use in any chronic infection would be useful. Naturally so good a result would not be expected in a chronic bacterial infection as could be obtained in syphilis, since in the former there are not so many protein colloidal particles in the serum, and it stands to reason that a direct ratio must exist between the beneficial therapeutic result obtainable and the number of particles present to be acted upon.

The following case of ulcus molle serpiginosum shows what a wonderful effect can be produced by the administration of powerful reducing agents.

CASE 7.—The patient had a soft sore in 1900. Five weeks after the sore had healed a bubo appeared in the right groin, burst, then healed up, to break down again a few weeks later and form ulcers, which spread up over the abdomen and down the right leg to below the knee-joint. The ulceration was still spreading in spite of various methods of treatment which had been employed, when the patient consulted me. Within 14 days after an intramuscular injection of intramine, 10·0 c.c., preceded by an intravenous injection of colloidal iodine 100·0 c.c., the ulceration, which had progressed without ceasing for 17 years, had completely healed.

I treated another case of ulcus molle serpiginosum, but with much smaller doses, as the patient was a nervous individual, and not nearly such a good result was obtained. I have since learned that, especially in chronic bacterial infections, such as gonorrhœal arthritis, &c., and in syphilis, the best results are to be obtained by using maximum doses of a few injections, and to allow as short a time as possible to intervene between the administration of any two of them. Satisfactory results cannot be obtained by commencing with small and continuing with gradually increasing doses. Before I found the correct dose of colloidal mercury I sometimes injected intramine intramuscularly on the same occasion as the mercury was injected intravenously, as the toxic symptoms caused by the latter were considerably diminished thereby. Theoretically, it was impossible to foretell whether the simultaneous administration of an oxidising and a reducing agent would be more efficacious or less so than allowing an interval to elapse between them. The following case will show that equally satisfactory results may be obtained by prescribing intramine and colloidal mercury together. This case had to be treated in the way prescribed as the patient would not have an intravenous injection, and it was imperative to rid him of his symptoms as quickly as possible.

CASE 8.—The patient had a hard sore on the right side of the glans penis and corona, an infiltrated papular rash, mucous papules in the mouth and between the toes, and very bad headaches. In this condition he had 10·0 c.c. of colloidal mercury (5 per cent.) injected into one buttock and 5·0 c.c. of intramine into the other buttock. The headaches passed away within 24 hours, the rash within eight days, and the sore with its induration had completely disappeared ten days later. The stomatitis, diarrhœa, &c., set up by the mercury was much less than the same dose had produced in other patients who had not had a simultaneous injection of intramine.

Owing to the pain caused by the intramuscular administration of colloids I have been attempting for some time past to prepare intramine suitable for intravenous use and have at last succeeded. The success has been largely due to the help given by my friend Mr. J. Ward, to whom I wish to express my thanks. Intravenous intramine is put up as a 0·1 per cent. emulsion, and the dose ranges from 20·0–100·0 c.c. Intramine injected intravenously causes no unpleasant sequelæ, with the exception of an attack of coughing just as the injection is finished.[2] Out-patients may be treated with it, and it does not cause venous thrombosis. The effect on the well-being of the patient by injecting intramine intravenously the day after colloidal mercury has been injected is astounding. While finding the correct dose for human beings, on two occasions I gave an overdose. Both patients received 20·0 c.c. of a 1 per cent. emulsion, with the result that they became very ill. They ran a high temperature, sweated profusely, complained of violent headaches, and had vomiting and diarrhœa. One of the patients had excruciating neuritis over the deltoid region of the right arm. Guided by the experience I had had with intramine curing mercurialism, on the third day, as the symptoms had not abated, I injected colloidal mercury intravenously, with the result that on the same day as the oxidising agent was injected the patients' condition became normal.

From this short article I think it is clear that the inclusion of arsenic in our chemo-therapeutic armamentarium is not necessary; that the combined use of oxidising and reducing agents is better than the employment of only oxidising or of only reducing agents; that the treatment of syphilis, so far as it affects the soldier's stay in hospital, can be very considerably diminished in duration; and that the severe after-effects, such as the increase in nervous syphilis, which will become more and more apparent, can be to a large extent avoided. Nine intravenous injections may be given in a fortnight, in which period practically any syphilitic symptom may be made to disappear.

This work also shows that, broadly speaking, our treatment of all diseases is the same, and that the therapeutic results are only more striking in protozoal diseases, especially in syphilis, owing to the peculiar physical properties of the colloidal protein particles in the serum of these diseases, which allow for a greater play of the processes of oxidation and reduction.

The treatment of diseases by drugs can never be perfect, since although the host attacks the poison or parasite by means of oxidation and reduction—a surface action—this oxidation and reduction is nevertheless regulated by the substratum to which the ions, which do the work on the surface, are attached. For treatment to be perfect we shall have to find out the chemico-physical nature of the various substrata, since specificity seems to depend upon the difference between them, and then to manufacture or synthesise them in the laboratory. At present drugs regulate the surface action, and vaccines, &c., the action of the substratum, but, unfortunately, the latter are not yet powerful enough to be curative.

Wimpole-street, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

Tropical Diseases in the Balkanic Zone.

A MEETING of this section was held on June 12th, Sir RICKMAN GODLEE being in the chair.

Major ALDO CASTELLANI delivered a lecture on Tropical Diseases Found in the Balkanic Zone. That most frequently met with was malaria, the protean nature of which, though formerly well known, had been again brought into prominence. Pernicious cases were common in the late spring, summer, and autumn. The symptoms might simulate many other diseases and a wrong diagnosis might easily be made, with very serious results. Cases with symptoms pointing to lesions of the central nervous system were far from being rare, and he had met with the following types: (1) comatose, (2) delirious, (3) cerebro-spinal meningitic, (4) hemiplegic or monoplegic, (5) bulbar, (6) cerebellar, (7) tetanic, (8) eclamptic, (9) aphasic, (10) amaurotic, (11) spinal. The classical varieties of malaria, as described in the books, were not frequent. A purpuric and hæmorrhagic form had occurred resembling scurvy. It was marked by petechiæ and hæmatomata, spongy and bleeding gums,

[2] The fit of coughing may be avoided by neutralising the emulsion with sodium hydrate just before it is injected.

and sometimes bleeding from mucous membranes. The spleen, however, was enlarged, and although parasites were found in only about 10 per cent. of the cases, the cases reacted to treatment by quinine. Another blood condition which might be closely imitated was pernicious anæmia. The patient was generally a young man or woman with the typical pallor and lemon-yellow tint of pernicious anæmia; in some cases the liver was enlarged, or, more rarely, the spleen; there was either no fever or very little. The blood might be negative for malaria on repeated examination and show most of the common features of pernicious anæmia, including a high colour index. In elderly people the profound anæmia might give rise to the suspicion of internal cancer. The lecturer had come across cases of malaria simulating other specific infectious diseases. The typhoid type was far from rare; the patient looked like a case of typhoid and the temperature was typhoid-like, whilst the spleen was large but not hard. Bacteriological examinations for typhoid and paratyphoid infections, however, were negative, whilst the blood was full of malaria parasites which in this type of case were very little influenced by quinine. He had seen cases of pseudo-cholera and pseudo-dysentery of malarial origin and also of pseudo-tetanus due to the same cause. Several diseases of the digestive system might be simulated by malaria—e.g., appendicitis and cholecystitis. Malaria might affect the respiratory and circulatory systems. He had seen several cases of dry bronchitis of malarial origin and one case of pneumonia-like consolidation with bloody expectoration, and also 3 cases of typical angina pectoris all cured by the administration of quinine. Heart-block, of which he had seen one case, and tachycardia and cardiac arrhythmia might be malarial. He had met with cases of peripheral arteritis due to the same cause and also neuritic cases resembling beri-beri and others of local œdema.

As regards the diagnosis of the malady in the Balkans, he suggested the following rules: 1. Whatever the symptoms of the case, one should always keep in mind the possibility of malaria. 2. A negative blood examination is of no importance whatever unless the examination is repeated many times and at various intervals. 3. If quinine does not influence the fever, this does not always exclude malaria. 4. While giving very great importance to laboratory methods—for it is only by this means that a positive diagnosis can be made with certainty—do not neglect the clinical examination of patients. Train your senses as much as possible. The importance of simple inspection and of simple palpation can hardly be exaggerated. A slight abnormality of the colour and pigmentation of the skin, easily overlooked by the inexperienced, may suggest a diagnosis of probability in an obscure case, and acting on it may perhaps save the patient's life.

For treatment of the disease in the Balkans, quinine was by far the most important drug; it should always be given in very large doses, at least gr. 30 to 60 daily, by the mouth in ordinary cases, by intramuscular injection in severe cases, intravenously in the pernicious forms. It must be admitted, however, that there were cases which responded very slowly to a simple quinine treatment. In them other drugs had been tried, such as arsenical preparations, antimony, and picric acid. When given alone none of these had much effect, but when used as adjuvants to quinine, some of them (arsenic, for instance) seemed to increase its beneficial action. A treatment which had given him good results in certain cases was a combination of quinine, phosphorus, and tartar emetic. The prognosis was good in the enormous majority of cases if efficiently treated; but it must be remembered that in pernicious cases a high mortality might occur despite energetic treatment, and that in a large number of cases, even of the benign form, the cure was merely clinical, complete sterilisation not having been achieved. The affection lay dormant for months and years, and any cause lowering resistance, such as chill or traumatism, might cause the acute symptoms to reappear.

Next to malaria, the diarrhœas and dysenteries were the most common affections. The majority of cases of dysentery were of bacterial origin, but numerous cases of the amœbic type also occurred. Cases of enteritis due to flagellates and, much more rarely, to ciliates occurred. Coccidiosis had been observed. Cholera and paracholera had been rare. Attention should be called to the choleraic type of bacterial dysentery; also to a peculiar type of diarrhœa seen in Serbian soldiers who had suffered terribly from starvation during the Albanian retreat, which closely resembled the famine diarrhœa observed in India.

Camp jaundice was common. Two varieties might be distinguished: (1) a very severe type with high fever, lasting 10 to 12 days, and showing occasional relapses—true Weil's disease—which was rare; (2) a mild type, often afebrile and very common. Weil's disease was, of course, of spirochætic origin, but in his opinion it was probable that many cases of the mild type were also spirochætic. In addition to true camp jaundice there were also cases of jaundice due to malaria, due to paratyphoid, and due to streptococci; nor should the icteric type of relapsing fever be forgotten. Enteric fevers were fairly frequent in the Balkans, but recently had not taken any epidemic form. In certain districts paratyphoid A and B were more frequently met with than true typhoid. Similar fever due to various intra-intestinal germs were not rare. Cases had been found due to *B. colombensis*. Attention should be paid to the not rare association of mixed infections of the typhoid and paratyphoid organisms. He had seen two cases in which there was infection by all three. Malta fever was not common. He had only seen two cases in Macedonia, and the kala-azar of adults he had never seen in the Balkans, though he had met with many cases of the infantile type in certain islands of the Adriatic and Ægean seas. Relapsing fever was quite common. In its treatment he had obtained the best results by a combination of salvarsan, neosalvarsan, or galyl, with tartar emetic. Typhus exanthematicus was, at the present moment, very rare, although a terrible epidemic raged in 1914 and 1915. Trench fever was occasionally met with. Both of the types described in France had been recognised in the Balkans. Pappataci's fever was extremely common in certain parts of the Balkans, especially in the late summer and early part of the autumn. It was often erroneously diagnosed as dengue, though a few cases of the latter had probably occurred. A distinguishing feature of Pappataci's fever was the flushing of the face, which had often the appearance of being slightly bloated. This flushing sometimes amounted to an erythematous rash, which also involved the neck. It was very persistent and lasted long after the fever was over. The mucosa of the soft palate presented a peculiar appearance, numerous small hyperæmic roundish spots, sharply limited by a line of demarcation between the hard and soft palate, being visible, which also persisted after the temperature had dropped. Leucopenia served to distinguish it from incipient typhus. Broncho-mycosis and broncho-spirochætosis were observed. Pellagra was quite common in several districts of Macedonia, but he did not think there was any danger for our troops. Of the tropical diseases which were of rarer occurrence he mentioned filariasis, sprue, intestinal myiasis, mycotic, spirochætic, and flagellitic urethritis.

Certain tropical skin diseases were frequently met with. The following were a cause of great discomfort in summer, and were often wrongly diagnosed: Dermatitis interdigitalis, epidermophytis or "mango toe," tinea cruris or "dhobie itch," prickly heat, various types of tropical pyosis, such as pyosis Mansoni, pyosis discoides, &c. He had seen in 1915 in Macedonian peasants cases of ulcus tropicum, oriental sore, ulcus infantum, blastomycosis, sporotrichosis, accladiosis, &c., and also numerous cases of trichomycosis axillaris flava, nigra and rubra, of intertrigo saccharomycetica, and various other hyphomycetic affections. He had also observed two cases of Madura foot, two of keratoma plantare sulcatum, and one of ainhum.

ULSTER MEDICAL SOCIETY.—At a meeting of this society held on May 31st the following office-bearers were elected for session 1917–18:—President, Dr. W. D. Donnan; Vice-Presidents, Dr. R. Leathem and Dr. W. S. Smyth (Antrim); Council, Dr. A. G. Robb, Mr. P. T. Crymble, Mr. R. J. Johnstone, Dr. F. Symth, Dr. G. A. Hicks, and Mr. H. A. J. S. Murphy; secretary, Mr. S. T. Irwin; treasurer, Dr. V. Fielden; librarian, Dr. W. L. Storey; editorial secretary, Dr. C. G. Lowry.

Dr. L. A. Tarassevitch's "Medical Bacteriology," which we reviewed in THE LANCET of June 2nd, is issued by the Publishing House Collaborator (Russ. *Sotroudnik*), of Petrograd and Kieff, who are being asked to send some copies of the book to England.

Reviews and Notices of Books.

Le Traitement des Plaies Infectées. By A. CARREL and G. DEHELLY. Précis de Médecine et de Chirurgie de Guerre. With 78 figures and 4 plates. Paris: Masson et Cie. 1917. Pp. 180. Price 4 frs.

The Treatment of Infected Wounds. By A. CARREL and G. DEHELLY. Translation by HERBERT CHILD, Captain, R.A.M.C. (T.V.). With Introduction by Sir ANTHONY A. BOWLBY. London: Baillière, Tindall, and Cox. 1917. Pp. 238. Price 5*s.* net.

AT the present time the Carrel-Dakin method is in frequent use in our army for the treatment of wounds. Simplicity is its great merit, and the method has proved of extreme value in many cases, although the difficulty of keeping the patient dry is a not inconsiderable drawback. Exigencies of circumstances in a particular case or difficulty of travelling, moreover, may cause imperfections in the technique with corresponding delay in the healing, while it is obvious that a vertical cup-shaped wound, with a fair-sized mouth and no leaking places at the bottom or sides, is likely to respond most quickly to the treatment. A large part of the book is taken up with information as to laboratory procedure, while at the same time it does not contain the amount of clinical information which might have been expected considering the important claims made on behalf of the treatment. The technique is, however, very fully described, and the pictures themselves give a good idea of the results that may be expected from this medical sterilisation of wounds. We recommend the book to all our readers.

Captain Child's translation, the early appearance of which shows commendable enterprise on the part of the publishers, is well done and makes Carrel's work accessible to the English reader. Sir Anthony Bowlby expresses in his introductory note the appreciation of British surgeons at the front of the value of Carrel's method. Whenever it has been thoroughly carried out it has, he states, accomplished all that has been claimed by its author and has benefited thousands of patients. He strikes a note of warning in regard to attempts to improve on Carrel's method, holding that modifications should not be introduced until the original method has had a proper trial. The translation will ensure the method a proper trial in this country.

Treatment of Joint and Muscle Injuries. By W. ROWLEY BRISTOW, F.R.C.S. London: Henry Frowde and Hodder and Stoughton. 1917. Pp. 148. Price 6*s.* net.

WITH the object of advocating his own method of treatment for muscular disability by means of graduated contraction of muscles, using for the purpose a faradic coil specially designed to give painless stimulation, the author gives a general account of the treatment of fractures, as well as of joint and muscle injuries. He contends that the essential factor in these conditions is the treatment of the muscles themselves, whether affected by direct injury or by reflex atrophy; that restoration of function is more speedily obtained by his method of electrical stimulation than by the more usual treatment with massage, which he describes as very tedious and very slow in producing a good result; and active exercises against graduated resistance, which are of little service when atrophy is well marked. War surgery has given an impetus to the electrical treatment of peripheral injuries, and the author's method appears to be an attempt to use rationally means hitherto employed casually and without conviction as to any resulting good. An important chapter is devoted to the treatment of peripheral nerve injuries.

JOURNALS.

The American Review of Tuberculosis. Vol. I., No. 1. March, 1917. Published monthly at 2419-21, Greenmount-avenue, Baltimore, Md., by the National Association for the Study and Prevention of Tuberculosis. Price $2 per volume to members, $3 to non-members. Single copies 35 cents.—The aims of this new journal are explained in a brief preface by the managing editor, Dr. Allen K. Krause (Baltimore), to be: to offer all who are interested in tuberculosis a medium in which to present their work and through which to develop their views; to stimulate productiveness and to interest those not directly concerned with tuberculosis but working in related fields. The editor-in-chief is Dr. Edward R. Baldwin, of Saranac Lake, who is assisted by an editorial staff of six—Lawrason Brown (Saranac Lake, N.Y.), H. R. M. Landis and Paul A. Lewis (Philadelphia, Pa.), M. J. Rosenau (Boston, Mass.), Henry Servall (Denver, Col.), and Borden S. Veeder (St. Louis, Mo.), while many well-known names occur in the list of associate editors. Of the first number, 50 pages are devoted to three original papers dealing respectively with classification, chronic non-tuberculous lung infection, and serological studies; 15 pages follow of abstracts from current medical literature. The last decade has seen a great revival of interest in America for research work in tuberculosis, witness the Phipps foundation at Philadelphia, the Trudeau foundation at Saranac Lake, and the Dows foundation at Johns Hopkins Hospital. The new journal is the result of this revival, and should be an important aid in focussing attention on research, whether clinical, pathological, or social, in the field of tuberculous disease. It is attractively bound and printed. We wish the venture every success.

Veterinary Review. Edited by O. CHARNOCK BRADLEY, M.D., D.Sc. Edin., M.R.C.V.S., Principal of the Royal (Dick) Veterinary College, Edinburgh. Published quarterly. London and Edinburgh: W. Green and Son, Limited. 10*s.* 6*d.* per annum.—This quarterly periodical is intended as a summary of current work of interest and value to the veterinarian, whether his sphere of life lies in the laboratory or the domain of the clinician, and in this issue the editor takes his readers over the best publications in medicine (human and veterinary) and agriculture in Great Britain, and also culls discriminatingly from those of America. Commencing with abstracts from anatomical and clinical sources, Dr. Bradley summarises the latest researches in surgery, pathology, toxicology, and therapeutics. Thirty pages are devoted to notes on books and general bibliography, and the ground covered is very large, showing how many spheres of work, other than those which are purely veterinary, can be turned to good account for the benefit of the suffering animal. Those who make a study of the comparative side of nature should see this quarterly periodical regularly.

Abstracts of Bacteriology. Under the editorial direction of the Society of American Bacteriologists. Editor: A. PARKER HITCHENS. Vol. I., No. 1. Cambridge University Press and Williams and Wilkins, Baltimore. February, 1917.—The Society of American Bacteriologists has already earned the gratitude of workers in bacteriology, especially as an applied science, by standardising various methods and materials. A year ago the society began to publish an official journal, and it has now decided to produce a bi-monthly number of Abstracts of Bacteriology, the first of which has just been issued. The two journals bear to one another a somewhat similar relation to that which exists between the *Annales de l'Institut Pasteur* and the *Bulletin*. The vast increase in the volume of original publications on bacteriological subjects, in which America has taken an almost preponderating share, has rendered works of this character not only useful but necessary. The abstracts in the present number are confined to American bacteriological literature, but even so they fill some 70 pages, and the list of journals, admittedly incomplete, with which it is proposed to deal in the future number over a thousand. Bacteriology has so many relations with medicine, agriculture, and industry that its literature appeals to a wide circle of readers who are not necessarily interested in it as a pure science. To such readers works like the present are especially useful; they furnish a guide to multitudinous publications, though all abstracts, however good, must be used with caution, and cannot be regarded with safety as doing more than indicate the kind of information which may be found in the original papers. Except that the present publication contains the Proceedings of the Society, it differs little in method and arrangement from other periodicals of like character published in various countries, though the arrangement of the papers concerned with human pathology is a little unusual, since they are grouped not according to the micro-organism concerned but according to the system—gastric, respiratory, or circulatory—in which the organism may happen to cause disease. The journal is produced with the luxury of paper, type, and margin which we associate with American scientific publications, and is assured of a hearty welcome.

THE LANCET.

LONDON: SATURDAY, JUNE 16, 1917.

The Readjustment of Civilian and Military Medical Needs.

THE position of medical officers forming the *à la suite* staffs of the Territorial general hospitals, a large proportion of whom have high professional position as consultants in various branches of medicine and surgery, appears to us to require consideration in the circumstances that have been brought about by the long duration of the war and by the enormous size of our present armies. It was very generally assumed under the original scheme by which the Territorial general hospitals were staffed that the medical officers would, at any rate in large proportion, remain in touch with civilian practice; but, as a matter of fact, many of these officers have now taken service abroad either under the Imperial obligation of their commissions or in obedience to the patriotic call for active assistance which they considered could best be answered by proceeding to one of the scenes of action. The loss of these *à la suite* medical officers to civil practice in their areas was not at first considered sufficiently closely as a matter that might become nationally serious, but we can now all see that it has become a very serious affair, and that as the needs of the War Office make ever-recurring drafts upon the medical personnel of the country, a point will soon be reached at which common prudence will demand a close consideration and, if necessary, a revision of the position.

The Central Medical War Committee, whose personnel has been strengthened by the addition of the names of Dr. H. J. CAMPBELL (Bradford), Dr. H. J. CARDALE (Cubitt Town), Lieut.-Col. J. MICHELL CLARKE (Bristol), Dr. T. W. H. GARSTANG (Altrincham), Dr. ARNOLD LYNDON (Hindhead), and Dr. H. J. STARLING (Norwich), has had under consideration the difficulties that the liability to sudden removal of medical men engaged in civilian practice may cause in localities where the existing civilian doctors are already hard pressed to meet their engagements, and as a result they feel that the situation is one that should be taken in hand. It must be remembered that at the present moment we are at the easiest period of the year for medical practice both of a private and of a State nature. The incidence of all ordinary diseases save certain epidemics is now distinctly lower than can be expected as winter approaches with the numerous and deadly conditions directly attributable to its more rigorous conditions. This is giving cause for thought among all who know how depleted already are the ranks of civil practices, and in many localities a feeling of apprehension has been created among those who are competent to look ahead and wise enough to know what to expect unless measures of security are taken beforehand. One very obvious point seems to have entirely escaped attention. It must be remembered that medical men also are liable to sickness and to the results of overwork, and if the demands on the civilian medical profession in this the healthiest season of the year are so large that efficient service can barely be maintained in any locality—and we are approaching perilously nigh to the danger-line—in harsher times the community must run the double risk, on the one hand of having a larger percentage of sick among them, and on the other of having a smaller medical service, a certain percentage of the doctors being themselves incapacitated.

To this double risk the population should not be submitted if it can be avoided, while it is enhanced still further by the sudden detachment from different areas of the recognised specialists for the district. The sooner those competent to deal with the situation are able to take it in hand the better it will be for all. It seems to us that the matter is one for conference and coöperation between the authorities at the War Office and the Central Medical War Committee, which represents alike the recruiting agency for the Royal Army Medical Corps and the machinery for the maintenance of the good health of the civilian population. The whole country, with regard to the medical service, as with regard to the other interests and amenities of life, is prepared to subordinate civilian to military interests, but where a certain amount of adjustment between military authorities and lay organisations can make the burden on the civilian population less hard to bear, while in no way imperilling the efficiency of the Army, such coöperation is greatly to be desired.

Arrested Tuberculosis and After-care Factories.

THE need is generally recognised for the continued care of all forms of tuberculosis which have been the subject of institutional treatment, but little has yet been put into practical effect. It would be a public misfortune if the scheme which was inaugurated by the late Dr. J. E. SQUIRE for the after-care treatment of sanatorium patients should be allowed to lapse for lack of his driving-power; but we cannot think that this will occur, so obvious is it that effort along the lines indicated would be amply repaid. Superintendents of sanatoriums have long recognised that the results of their work were seriously imperilled for want of proper supervision of their patients after leaving the sanatorium. Sanatorium treatment can do no more than build up health to the point of arrest of disease; it is not intended to maintain this condition—indeed, the amount of accommodation provided, in this country at any rate, forbids such prolonged attention. But patients who have benefited by their stay in the sanatorium return to their former occupation without any idea of the risks of relapse that are incurred; they work ordinary hours, many of them in the whirlpool of factory life. During their absence in the sanatorium domestic finances

have frequently become straitened, and the inducement to work strenuously in order to earn full wages is therefore very urgent. Small wonder, then, that many arrested cases quickly relapse, with the inevitable result, for recovery from tuberculosis seldom proffers itself twice to any man.

The superintendents of sanatoriums, fully aware that this industrial ordeal will sooner or later have to be faced by many of their patients, have attempted to prepare them for it by organising physical labour of various kinds; but valuable though such exercise may be, it inevitably lacks the stimulus of being remunerative, at least to the extent to which the skilled craftsman feels that he is entitled. In most cases, too, this improvised labour bears no relation to former occupations, and may, indeed, be detrimental to the resumption of such occupations, as, for instance, when the delicate touch of the typist or stenographer is dulled by handling pick and shovel for agricultural purposes. In a report published two years ago by the Medical Research Committee on the prevalence of pulmonary tuberculosis in the boot and shoe industry, the situation was carefully considered and an interesting recommendation made, the principle of which may well be applicable to other industries. We summarised[1] at the time the essential points of the suggested scheme, of which the following extract gives the gist:—

> Briefly, the scheme is to establish, in connexion with the ordinary form of sanatorium, a workplace for the manufacture of boots and shoes. Here consumptive operatives in an early stage of the disease and convalescing patients could carry on their trade under medical supervision for such hours as they are able, and earn wages in proportion. As health is re-established the working hours and earning capacity would be increased, until finally normal hours could be safely undertaken in many cases, and factory employment resumed. The conditions under which work would be done should preclude any possibility of the materials handled becoming sources of infection. It would be among the more important advantages offered by the plan for a factory sanatorium if as a result of his stay an operative could be taught how to carry on his handicraft under hygienic conditions. The influence upon his fellow men of his acquired habits after his return to the factory might be considerable. Many circumstances seem to point to the boot and shoe industry not only as one in which the evils of phthisis are conspicuous, but also as that for which the establishment of a sanatorium in which employment is provided is most easily practicable. The industry is not a scattered one, but is segregated in particular towns, and the nature of its technical processes raises no insuperable difficulties to their performance under sanatorium conditions.

The plan here advocated seems reasonable and practicable, and is one which should forthwith be carried out. But various administrative details come up for consideration. Would after-care factories be counted as sanatoriums with a right to claim grants? Would Approved Societies pay sickness benefit to inmates of a sanatorium earning wages for part-time work? The whole subject is one that points to the need of the general supervision of medical relations towards the State that would be supplied by a Ministry of Health; for a centralising body would be able to unite the authority of the Local Government Board over sanatoriums and that of the Home Office over factories, on the common ground of the after-care factory.

The present time is opportune for preparing a general scheme, inasmuch as at the end of the war there will exist a number of buildings well suited for conversion into after-care factories—namely, the extensive national factories now used for munitions of war. These factories consist of a large number of more or less isolated single storey workshops, connected together by convenient platform runways; while heating, lighting, and power are all laid on to each workshop. Canteens, ambulance-rooms, doctors' quarters are also in existence. The installation of the requisite machinery for the manufacture of boots and shoes, for printing purposes, or for the tailoring trade, when these workshops are no longer wanted for their present purpose, should not be an expensive matter. The Chairman of the Investigation Committee of the Medical Research Committee, to whose report we referred above, is at the moment the Minister of Munitions, and we trust that Dr. ADDISON will not hesitate to use the establishments which he has brought into existence to meet the necessity of war for the purpose of re-establishing the health of workers when they are no longer required for their original purpose.

[1] THE LANCET, 1915, ii., 1359, 1422.

Hospital Sunday, 1917.

ON Sunday, June 24th, the Metropolitan Hospital Sunday Fund will appeal to the generosity of the public in London and throughout the United Kingdom, and again, as in many previous years, we press that appeal upon all, hoping that what we urge may find a hearing beyond the circle of our usual professional readers. The shadow of war which hangs over us does not lighten, but we face the struggle with a steady hope for a brighter future to come, prepared to meet with fresh economies the drain of war upon our resources. With the hospitals the case is different. Not on the future do they rest their hopes in consolation for present conditions of stress and uncertainty. Theirs is the present. The hospitals are doing their share, and more than their share, in meeting the present needs of the nation, of its soldiers and of its citizens, relying upon the nation's gratitude and the generosity of the benevolent to help them to meet the bill. The ground of appeal is a familiar one; we made it last year, and we make it again now. In no year since hospitals have existed in London has their claim been stronger upon the public gratitude, and in no year has their need been greater or more obvious to all.

In reminding the public of its debt to the hospitals, the sense of justice should stimulate its generosity and result in freely giving. Probably a large section of the population still forgets to name the hospitals of London among its creditors. Now and again some innovation—or supposed innovation—in medicine or surgery attracts popular attention in the newspapers, as in the case of certain antiseptics. To the man in the street it

appears, no doubt, that someone working in a hospital laboratory has been inspired by a brilliant or a happy idea, and that something of real utility in saving the lives or limbs of our soldiers at the front has been the fortunate result. What we want him to realise is that years, or it may be scores of years, of patient and laborious work in those hospitals, have led step by step, through good report and evil report, in all the discouraging circumstances of restricted opportunity and lack of funds, not to isolated "discoveries" and fitful progress here and there, but to results already rendered memorable in every civil and military hospital. Medicine has strained every nerve to meet the huge demands of war without neglecting the needs of a civilian population which runs the multitudinous risks of industrial life. The hospitals of the United Kingdom have trained the physicians and surgeons for their work and have placed their services at their country's disposal. In the laboratories and operating wards of the hospitals the whole scientific equipment of medicine and surgery has been developed and organised, and on them all future progress rests.

We claim for the hospitals of London no more than their just share of this great work; but the appeal of Hospital Sunday is primarily for them. The Metropolitan Hospital Sunday Fund is an opportunity for rich and poor alike. Its contributors include those who can afford to give large sums, and those other thousands who can give small sums. Their mites count for much, and the personal interest which those mites represent counts for incalculably more. Sunday is a visiting day at most hospitals, military and civil. Thousands of relatives in London will be sitting on Hospital Sunday at the bedside of men shattered by deadly engines of warfare, racked by war's diseases, overwhelmed by its shock and strain. We ask all of these to remember the hospitals for which the Metropolitan Hospital Sunday Fund makes its collection on that day. But besides these we ask all our fellow citizens to remember that in war, no less than in time of peace, the daily work of the hospital must be carried on in spite of high prices and financial strain for which time affords no parallel. The dangers and ills of civil life are still with us, and their contribution to the list of sick and wounded, always a large one, is liable to sudden variations. The street accident daily brings its quota of maimed and injured to the hospital wards, a constant stream liable to sudden increase by the destruction which the present week has brought. London remains the centre of a nation struggling for its existence against the foes without and the subtler foes within, against which its hospitals are the chief line of defence, and we call upon its citizens to realise their indebtedness and to make a generous response.

AN AMERICAN RED CROSS SCHEME.—A plan by which large industrial corporations will declare special dividends for the Red Cross has been devised in America. It is calculated to yield a minimum of £5 000,000.

Annotations.

"Ne quid nimis."

THE CROONIAN LECTURES.

IN his first Croonian lecture, on Adaptation and Disease, last Thursday, Lieut.-Colonel J. G. Adami, F.R.S., justified his choice of subject on the grounds that administrative duties had debarred him from sustained laboratory research and that the time was more than ripe for bringing the investigations of the bacteriologist and of the student of immunity to bear upon the important problems of general biology. The supreme biological problem of our times had been that of the ways and means of evolution; but while the fight centred essentially upon the cause or causes of variation: whether variability was, in fact, primarily inherent, proceeding from within, or primarily acquired, proceeding from without—this basal problem had been largely neglected for the secondary problem, whether properties acquired by the parent could be transmitted to, and reproduced in, the offspring. After briefly recalling the views of Lamarck, Darwin, Herbert Spencer, and Weismann, Colonel Adami dealt in more detail with Sir William Bateson's latest hypothesis that when a new property manifests itself in an individual of any species, it is not new, not due to addition, but to subtraction and loss of properties already possessed. According to this view, what appears to be a new property is primeval, the manifestation of a property possessed by the forerunners of the species, which all along has lain latent, present but unable to manifest itself hitherto in consequence of the co-existence of inhibitory factors. The sudden appearance of new determinants in the germ cell and the consequent accretion of new properties form no part of the Batesonian doctrine which, pushed to its logical conclusion, means that the primal unit, or units, of protoplasm from which all living animal and plant forms have descended, possessed within it in a latent form the originals of every organ and of every distinctive portion of an organ or part, even down to the conformation and colouration of individual hairs and scales. According to this view, what we regard as the higher forms of life were really the lower, owing their development not to progressive accretions of properties but to the reverse, so that reversion, instead of being a degenerative manifestation, a loss of properties acquired by the species, became a recovery of higher and completer powers. Colonel Adami queried whether any exercise of mediæval scholasticism ever led to a more perverse conclusion than this. Valuable and fascinating as were the recent observations for the amplification of Mendel's law, that law only established the extent of variation possible *within the boundary of the species*. Employing Mendelian methods, we produce at most different strains of a species which by a cross fertilisation with other strains produced in turn individuals reverting to the usual type. Such interplay was not, however, capable of throwing light upon the progressive development of new species. Sir Ray Lankester saw in "direct adaptation," as adopted by Herbert Spencer, the fallacy of all Lamarckian doctrine. But the fact constantly impressed upon the student of immunity and the worker in pathogenic bacteriology was that "direct adaptation"—i.e., a specific modification in response

to specific alteration in environment—was one of the basal phenomena of living matter. Colonel Adami proposed, therefore, to consider in his later lectures (June 19th, 21st, and 26th, at 5 P.M.) the evidence of adaptation as it affected the pathogenic bacteria, passing on to adaptation affecting man and the higher animals, and concluding with the application of these data to our conceptions of disease and of evolutionary processes.

WAR AND INSANITY: LUNACY AND MENTAL DEFICIENCY IN 1915.

TWO annual reports on lunatics and mental defectives have recently appeared. One of these, the Third Annual Report (for 1916) of the General Board of Control for Scotland, is largely of a statistical character, although sufficient is said to show the malign effect of the war in the curtailing of expenditure and the shortage of trained attendants in the asylums. The other is the Second Annual Report (for 1915) of the Board of Control for England and Wales, of which the first part, just issued, is general in character and deals with certain points of contact between the war and asylum practice. It emerges, for instance, from the English report that under present conditions it is impossible to form any judgment as to the influence of the war on the numbers of the certified insane. Of the whole population a certain proportion become insane in ordinary conditions, and of the 5,000,000 soldiers a proportion will similarly suffer. As the military age includes the most healthy and strong, a smaller proportion would be expected to become insane than in the general population, and it is noteworthy that there has been a decrease in the admissions to asylums. The number of notified insane persons in January, 1916, was over 3000 fewer than in January, 1915, contrasting with the average increase for ten years past of over 2000. The reduction does not appreciably affect any particular class, but the war has had several incidental effects on asylum practice. For instance, a number of large asylums have been converted into military hospitals, the superintendents becoming temporary officers of the Royal Army Medical Corps, while a large number of male attendants have joined the army, their places being taken in some asylums by female nurses. On the whole this has been found to answer well, but some asylums have declined to receive maniacal men on this account.

In English borough and county asylums the decrease in male admissions was nearly twice as great as in females. This has been due to two causes: first, to the absence of men at the war, and, secondly, to the very serious and important reduction of the staff of male attendants called up to service, with the result, already indicated, that certain male patients are not sent to asylums at all. Many soldiers who have become insane are treated in military hospitals at home or abroad and are not certified, thus escaping what would sometimes be an unjustifiable stigma, while non-certification makes possible their return to the Army. Although the reduction in the number of admissions is, therefore, on several grounds and to some extent fictitious, the increase of employment and the improved condition of the working classes may be reasonably inferred to have had their influence. The death-rate among the insane population remained unaltered for the year, the excess of male deaths being due chiefly to general paralysis. But asylum dysentery increased during the year and this should give rise to serious thought, as a similar increase has been previously noted. In 1914 there occurred in 97 English asylums 1324 cases of dysentery, in 1915 the number was increased by nearly 100 per cent. There is room here for strict investigation, and it is worth noting that the disease had shown its growing prevalence before war conditions could play any part in causation.

Turning to work of a constructive nature, attention is called in the English Report to the growing feeling which exists among all classes that a time has come when the feeble-minded should be protected and the welfare of society promoted by the establishment of reception houses and colonies where defectives can be detained and trained. The war, unfortunately, has hindered the full development of the scheme, but enough has been done to prove the utility of the measure. Returns are given in the English Report showing the frequency with which the feeble-minded girl becomes the mother of several illegitimate children who may inherit mental and moral weakness, and who at any rate are sure to be brought up in the worst of environment and social conditions. There is no need in these columns to give further examples of the terrible danger that is constituted by that class of persons who have improper appreciation of the rules on which social life must be conducted, nor to insist on the need for a clear recognition of the responsibility of the State for the troubles which these unfortunates unwittingly bring upon themselves and on the whole of society. The partial and spasmodic treatment of these cases by the Poor-law is characterised as a grave administrative extravagance, and all must regret the small progress that has been made, owing to the war, in applying the provisions of the Mental Deficiency Act. Some compensation is fortunately afforded by the real impulse which has lately been given to scientific research into mental disease and mental defect.

THE BATTALION MEDICAL OFFICER.

THE Army is fortunate in possessing hygienists of high standing, text-books in sanitary science of great lucidity, and sanitary orders which have been worked out in the light of practical experience for a period now of nearly three years. Army sanitation has, in fact, attained a high level, far higher than can be hoped for in many departments of our home sanitation where the enforcing power of military discipline is absent, and the whole nation must take carefully to heart in the peace times which are coming the lessons afforded by the war. And it must be remembered that even in the presence of military discipline it is the individual soldier who carries out the sanitary régime, and on him, in the end, the efficiency as a whole of any sanitary administration depends. It is here that the battalion medical officer can play his part, for he is brought into intimate personal contact with the men, and on him rests the onus of impressing the elements of sanitation on them in a form which they can understand. In another column Captain Hugh W. Bayly lays stress on this position enjoyed by the battalion medical officer, and suggests that as a matter of routine such officers should issue standing orders for the guidance of those under their sanitary charge. The battalion is the smallest unit in military life, and, like the family in civilian life, tends to have individual habits of thought and its own way of expressing

them; and it is probable, as Captain Bayly suggests, that the most efficient sanitation may be got out of the battalion by a medical officer who studies its particular conditions. For the battalion to which he was attached as medical officer Captain Bayly drew up a code of sanitary standing orders which he found successful in that case, and we commend his suggestions to the consideration of other battalion medical officers. In an appointment which is frequently of a temporary nature it is not very easy to take the keen personal interest in the work which alone ensures its efficiency, but the battalion medical officer may well remember that the saving of lives depends as much, if not more, on his insistence on the sanitary instruction of the private soldier as on the more dramatic work of rescue and first-aid to the wounded.

ROYAL MEDICAL BENEVOLENT FUND: AN EMERGENCY APPEAL.

IT is now nearly a year since an appeal was made by the office-bearers of the Royal Medical Benevolent Fund for liberal support to a special emergency fund to assist medical men in temporary difficulty in consequence of having joined the Army Medical Service. A ready response was given to this appeal, enabling the Fund to deal with a number of urgent cases where help was needed, and to render in some of them more substantial assistance by coöperating with other benevolent societies, such as the Officers' Families Fund and the Professional Classes War Relief Council, any possible overlapping of effort being thus avoided. As time goes on the need has, unfortunately, steadily become greater, and in a letter this week in our correspondence columns an appeal is made for a much larger sum than was obtained last year. This sum should be forthcoming, whether from within or without the profession. The demands made on the medical man at the present time are searching and imperious; he is recognised as being more essential than ever to the community, and it is only fair that his work should not be hampered by mental anxiety for his own financial position, or that of his family if he is killed or disabled. The medical profession may well be grateful to the officers of the Benevolent Fund for their discerning labours on its behalf.

AN ESKIMO DEFICIENCY DISEASE.

THE recently-recognised group of diseases attributed to deficiency in the diet of certain ingredients present only in small amount (vitamines) is very limited. Beri-beri and scurvy are the best-known examples. In the *Boston Medical and Surgical Journal* of May 3rd Dr. John M. Little has described a disease known to the Eskimos of Labrador and Baffin Land as "kallak," which he regards as of this nature. The diet of this primitive people is mainly animal, and consists of seals, caribou, birds, and fish. Where civilised food is not available they depend for carbohydrates mainly on berries and on the partly-digested stomach contents of animals killed. Their great feast after killing caribou is a thick soup made of its stomach contents and blood. The mosses, grasses, young shoots, and leaves eaten by these animals are possibly transformed by their hardier digestion into forms assimilable by man. It is to be expected that when stress of circumstances reduces this limited dietary deficiency disease would arise, and this is so. The frequency of scurvy among the Eskimos is well known, but they appear to be also liable to another deficiency disease. Ten years ago, before the term vitamine was coined, Dr. Little described "kallak" in the *Boston Medical and Surgical Journal* as an endemic disease commencing with an eruption of pustule-like lesions in crops on the hands, elbows, buttocks, and other parts, no organisms being found until secondary infection takes place. There is intense itching, the course is protracted, and recovery ultimately takes place. Discussing the etiology he said: "While it may occur at any time of year, if they have plenty of seal flesh to eat they don't have kallak. Most of the cases, as well as the worst cases and the epidemics, occur in the autumn, after they have been living almost exclusively on a fish diet, and especially after failure of the berry crops." The best treatment is the addition of seal meat and berries to the diet. Dr. Little now suggests that the disease is due to some fat-soluble vitamine present in the fat of seals and caribou. That the disease is not racial but is due to the mode of life of the Eskimos is shown by the case of a young Scotchman who was wrecked on a whaler in Baffin Land and lived the Eskimo life for a year. He gave Dr. Little a good description of kallak, and said that he had almost died from it.

TECHNICAL OPTICS.

WE understand that arrangements have recently been completed for an important development in national industry on the scientific side by the establishment of a new department of technical optics in connexion with the Imperial College of Science and Technology at South Kensington. The department in question forms part of a larger scheme adopted by the London County Council in August last for the provision of instruction in this most important subject (in which the Council promised to find certain moneys for the scheme, if the Government also contributed), including post-graduate and research work at the Imperial College, a trade school, and senior day and technical courses at the Northampton Institute, and junior technical courses at two junior technical institutions, one in North London and one in South London. Since August last the Government, including the new Department of Scientific and Industrial Research and the Imperial College, have decided financially to support the Council's scheme and all the necessary assents have been obtained. The amount of money immediately available is £4000 a year for working expenses and £5000 for equipment and more immediate necessities of the department. The new department is under the management of a Technical Optics Committee of which the Right Hon. Arthur H. D. Acland is chairman, and at present it consists of 13 members representing the Admiralty, the Army Council, the Ministry of Munitions, the Royal Society, the National Physical Laboratory, employers in the optical trades, glass manufacturers, and the Imperial College; while two further members have yet to be elected representative of glass-workers and metal-workers. The same committee appointed by the London County Council is also an advisory committee to the Council. Mr. Frederic J. Cheshire has been appointed head of the new department at the Imperial College for a period of five years, with the title Director of Technical Optics and Professor of Technical Optics at the Imperial College. Mr. Cheshire's long experience and great ability in optical matters are well known, and practically ensure a successful begin-

ning. He has been associated with optical instruments for many years at the Patent Office, and since the formation of the Ministry of Munitions has been Deputy Director-General of the Ministry and Technical Director of the Optical Department of the Ministry. He is the present President of the Optical Society. It is expected that, subject to the conclusion of certain arrangements with the Treasury, Mr. Cheshire will accept the directorship, and it is anticipated that the organisation of the Department will be rapidly completed, and that training will begin at an early date.

CHESTNUTS AND ACORNS IN WAR SERVICE.

THE manufacture of modern munitions has so far implied a certain demand on cereals which otherwise could be used for food. This is an unfortunate diversion, and it is gratifying to learn that, instead of using cereals, other materials not so far made fit for human food, as, for example, the common horse-chestnut, are to be employed. We may point out similar possibilities in regard to the acorn, vast quantities of which are wasted every year. The composition of these nuts has something in common, as will be seen from the following figures:—Horse-chestnut: water, 38·9 per cent.; protein, 4·8 per cent.; fat, 4·6 per cent.; carbohydrate, 50 per cent. Acorn: water, 6·3 per cent.; protein, 5·2 per cent.; fat, 4·3 per cent.; carbohydrate, 45 per cent. The most important constituent of both is the carbohydrate, in the form of starch, while the acorn should have further value on account of the substantial proportion of fat which it contains. Neither nut has as yet been used to any extent for human consumption, and it is possible that their utilisation in some way or other, whether for food purposes or not, may be one of the results of the relative food shortage. The first step has now been taken in the substitution of these nuts for cereals in the production of munition agents. Other abundant vegetable products may also be pressed into service. It is, of course, possible to convert wood, linen, cotton, and the like into sugar, but the process of conversion does not yet appear to have attained practical dimensions or to have reached an economic stage.

THE "INDEX-CATALOGUE."

BY a happy coincidence, along with the group of American surgeons who have come to Europe's aid has arrived the last volume completing the second series of the great index-catalogue of medical publications, issued by the Surgeon-General of the United States Army from the Medical Museum and Library. The value of this catalogue to medical science it would be hard to exaggerate. It is one of the principal agents in the standardisation of medical records, ensuring that published work shall not be overlooked by later authors. The orderly arrangement of the index is in itself a work of genius, and has formed a model for other medical libraries all over the world. The Surgeon-General's library contained on August 1st, 1916, when the preface to this volume was written, more than 224,000 volumes and 337,000 pamphlets. In the index-catalogue as far as published appear 346,000 author-titles and 305,000 book-titles, as well as over a million journal articles and 5000 portraits. Within the last five years have died both the men mainly responsible for the production of the catalogue—viz., the chief assistant librarian, Dr. Robert Fletcher, in his 90th year; and Dr. John S. Billings, the principal upbuilder of the Surgeon-General's library, and the creator of its index-catalogue, at the age of 75. The general plan of a combined index of authors and subjects, arranged in dictionary order in a single alphabet, and the system of subject rubrics with cross references, were devised by these two men and blocked out prior to the publication in 1880 of the first volume of the first series; and these principles have been adhered to ever since. Dr. Fletcher devised all the abbreviations of periodicals employed in the catalogue up to the time of his death, and a list of these abbreviations and of the medical periodicals of the world—forming, in fact, almost a reference library in itself—is contained in this volume of the index-catalogue. Here the convenience of the reader has counted more than rigid adherence to uniformity, and this principle is conspicuous throughout the work as a whole. A third series of the catalogue is now in preparation. The medical profession is under a deep debt of gratitude to the Surgeon-General of the United States Army for a treasure-house of information.

THE PHYSIOLOGY OF THE PRE- AND POST-CENTRAL AND PARIETAL CONVOLUTIONS.

THE exact function of the central and parietal gyri has long been a subject of dispute among physiologists and clinicians. According to one view the cortical zones for motion and for sensation, situated in the central convolutions, are one and the same, physiologically speaking: in the same cortical area where end the afferent neurons from a limb the movements of that limb are initiated. Opposed to this conception, which has been upheld by a number of distinguished investigators, is a theory of the sensomotorium which regards the motor and sensory centres as anatomically and physiologically separable, the former being localised in the precentral and the latter in the postcentral gyrus. Various facts appear to lend support to this second theory. The cytoarchitectonic arrangement of the cortical layers of the precentral gyrus is quite distinct from that of the postcentral, and though differences in structure may not correspond to differences in function the fact is undoubtedly suggestive. With lesions of the precentral there is marked degeneration of the cortico-spinal (pyramidal) tract; with lesions of the postcentral practically none. In a number of carefully observed clinical cases pure lesions of the precentral have been unaccompanied by sensory symptoms, or these, if present, have been transient, while lesions confined to the postcentral or parietal areas produce symptoms that are almost entirely of a sensory nature. Recent experimentation in anthropoid apes and in man also has definitely shown that with weak electrical stimuli individual movements can be elicited only from the precentral gyrus, whereas in the case of a conscious patient whose postcentral convolution was thus stimulated sensations were produced and referred to the opposite hand, but they could not be obtained from the precentral. Finally, experimental extirpation even of small areas of the precentral cortex is always followed by crossed paresis or paralysis, while with removal of large sections of the postcentral no paralysis, or only a transient one, results. Mention ought, perhaps, also to be made of a third view, associated with the name of the late Dr. Charlton Bastian, according to which the central

gyri are purely sensory, the motor centres being entirely subcortical or spinal. Dr. M. Minkowski, of the University of Zürich, has published in the *Correspondenz-blatt für Schweizer Aerzte*, of March 24th, a detailed record of experimental research which he has conducted with a view to elucidating the subject. He used apes for the purpose, examining them at intervals for a year or longer after the operation. His conclusions may be summarised as follows. Removal of the precentral gyrus results in an immediate complete crossed hemiplegia, gradually clearing up and leaving a permanent hemiparesis; contralateral hemihypæsthesia is only an initial symptom which soon disappears, with a slight defect of deep sensibility as the only persisting impairment. Extirpation of the postcentral gyrus causes no paresis even at the beginning, but only a loss of sensation on the whole of the opposite side of the body. This involves particularly tactile sensibility and localisation, in which improvement gradually takes place, though there remains a permanent defect in the hand; pain appreciation is but slightly affected and soon recovers; deep sensibility is much impaired and improves slowly and imperfectly. After removal of the postcentral and the parietal convolutions, including the supramarginal, no paresis follows; there is, however, a severe hemianæsthesia for all forms of sensation, more marked than with removal of the postcentral alone; restitution is very incomplete; after two years (in one animal) touch and localisation of touch were still quite lost, while the sense of pain was distinctly less imperfect and the localisation of painful stimuli was often correct. Deep sensibility remains badly defective. The author agrees with the view that the motor and sensory representation of the opposite side of the body extends over the precentral, postcentral, and parietal cortex, but this region constitutes no uniform sensomotorium; on the contrary, it is subdivided functionally in a fashion that follows, to some extent, architectonic differences. Deep sensibility appears to be represented over the whole of the area (ataxia occurs as a temporary symptom only with involvement of both the parietal and the postcentral cortex); cutaneous sensibility with the appreciation of local signs is mainly but not entirely post-central; touch is widely represented over the whole, perhaps even more widely in a diffuse way; pain is less impaired than any of the other forms of sensation, and therefore has probably, according to Dr. Minkowski, a specially wide and diffuse representation in the cortex.

THE METROPOLITAN WATER-SUPPLY.

WE deal with the three monthly reports on the metropolitan water-supply issued during the first quarter of the present year. It is interesting to consider the amount of rainfall in relation to the quality of both the raw and filtered waters. The opening months of the year were characterised by a drop in the mean rainfall. Thus in January the mean rainfall was 1·55 inches, being 0·68 of an inch below the average mean rainfall for that month during the previous 34 years. In February and March the figures were 1·12 (−0·95) and 2·15 (−0·03) respectively. With regard to the quality of the water in *January* chemical examination showed that the raw Thames and Lee waters deteriorated as judged by the permanganate, turbidity, and colour tests, and improved as regards the albuminoid nitrogen test. The raw New River water deteriorated in quality on all tests. The filtered waters improved in quality as judged by the albuminoid nitrogen test (excepting New River, Grand Junction, and Lambeth), permanganate, and colour tests (New River, Chelsea, and Lambeth excepted). There was no change in the Southwark and Vauxhall supply as regards colour test. Comparing these monthly results with the 1916 averages, the raw Thames and New River waters yielded results worse than the average as judged by the usual tests excepting that for albuminoid nitrogen. Lee river water was better except as regards turbidity. The filtered waters yielded worse than average results by chemical and colour tests, East London, Kempton Park, Grand Junction excepted. All three raw waters contained in January more bacteria than the average for 1916, while the filtered waters were satisfactory. Coming now to *February*, the results of chemical examination showed that all three raw waters improved in quality, as judged by the albuminoid nitrogen, permanganate, turbidity, and colour tests. The filtered waters also improved in the light of these tests, and compared with the 1916 averages the raw Thames and Lee waters yielded better results. New River water (raw) was also better than the average as judged by the albuminoid nitrogen and permanganate tests, but worse as regards turbidity test, while there was no change in regard to the quality of colour. The filtered waters yielded results worse than their respective averages, as judged by the albuminoid nitrogen test (New River, Lee, and Chelsea excepted), but better than the average (Lambeth and Southwark and Vauxhall excepted) as judged by the permanganate and colour tests. The raw Thames and New River waters contained more bacteria and the raw Lee water fewer than their respective averages for the year 1916, while the filtered waters showed a high standard of bacteriological purity. In *March*, with a practically normal rainfall, chemical examination showed that the raw Thames and Lee waters deteriorated in quality as judged by the albuminoid nitrogen, permanganate, turbidity, and colour tests, while the raw New River water improved, as judged by the albuminoid nitrogen and colour tests, but deteriorated as regards permanganate and turbidity tests. The filtered waters showed deterioration in quality in some instances, while compared with the 1916 averages the raw Lee and New River waters yielded more favourable chemical results, but they were worse as regards the turbidity test. The raw Thames water gave better results by the chemical tests, but was not so good on turbidity and colour tests. The filtered waters yielded results worse than their respective averages in many instances, but as regards colour all the treated waters showed an improvement. The raw river waters contained fewer bacteria than their respective averages for the year 1916, while the filtered waters gave not unsatisfactory results.

THE Cavendish lecture of the West London Medico-Chirurgical Society will be delivered at the West London Hospital on Friday, June 22nd, at 8.15 P.M., by Captain Andrew Macphail, C.A.M.C., professor of history of medicine at McGill University, Montreal, who has chosen as his subject, "A Day's Work." Representatives of the medical services of all the Overseas Forces will be present and past Cavendish lecturers and the presidents of London medical societies are specially invited. Invitation cards may be had on application to Dr. Reginald Morton, 66, Harley-street, W. 1.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

The War Cripple: Accommodation and Vocational Training.

A YEAR ago the total number of soldiers returned wounded to Canada and still under treatment was 1530; on Dec. 2nd, 1916, the number stood at 2634; and since the beginning of the present year the numbers have rapidly increased, reaching high-water mark—namely, 5677 on April 15th, in spite of hundreds discharged in the meantime. Nearly all the recent arrivals have been convalescents, no large number of bed cases having been returned so far. According to the recent report of the Military Hospitals Commission, Canadian invalids in England have been reduced in numbers from 20,256 on Oct. 20th, 1916, to 14,545 on March 30th, 1917, the distribution being as follows: In Canadian hospitals, 8926; in sanatoriums for consumptives, 92; in British hospitals, 5527. The duties of the Canadian Military Hospitals Commission are, in the main, two-fold, to provide hospital and other accommodation for the returned invalid soldier, and to supervise his vocational training. The actual treatment and provision of medical personnel in the hospitals remain in the hands of the Army Medical Corps.

In regard to severer injuries the Military Hospitals Commission arranged some time ago with several general hospitals in Canada for accommodation for 1600 "bed cases." Accommodation is being provided for 1200 others in buildings taken over or erected by the Commission itself. At St. John, N.B., the armouries have been converted and are now ready for 350 of these cases; at Kingston, Ontario, the Convocation Hall of Queen's University has been turned into a hospital and is now ready for use with 550 beds; at Winnipeg, Man., a new hospital has been erected in the old Agricultural College with 320 beds, to be divided between convalescent and active hospital cases; at Quebec and Montreal the Savard Park and Grey Nuns' Convalescent Hospitals may be used for convalescent bed cases later on. Both are ready without any alteration.

For consumptives 1250 beds are now available, and the accommodation is being largely increased. At Kentville, N.S., the Commission has added two pavilions for 64 soldiers, with the addition of a vocational building; at Kingston, Ont., the new buildings at the Sir Oliver Mowat Sanatorium have been completed for 175 patients; at Hamilton, Ont., three smaller pavilions and a vocational building are finished, and two large pavilions are nearly completed; at London, Ont., three new pavilions are already in use and an infirmary building is being added; in Manitoba two soldier pavilions are being added to the provincial sanatorium at Ninette; in Saskatchewan the Earl Grey School in Regina is being transformed into a sanatorium; an infirmary building is being added.

More room is being provided for convalescents. A convalescent hospital is being erected at Halifax, N.S., with three residential buildings for 300 men, to be finished by July 1st; two Presbyterian College buildings to accommodate 125 men have also been taken over. At Sydney, Cape Breton Island, a private house in fine grounds is in commission with accommodation for 100 men. At Montreal the former Loyola College has been taken over and 100 are there, with room for 250; St. George's Home, holding 50 men, is also occupied. At Whitby, Ont., the magnificent hospital for the insane of the Ontario Government has been leased providing accommodation for 1500 before the end of the present summer and a vocational building is under construction; at Guelph, Ont., another fine provincial building will shortly be ready with accommodation for 800 men and will be the great re-education centre of Ontario for the men who need training for new trades; the new Salvation Army building in North Toronto will be an orthopædic hospital for some 450 men needing artificial limbs, a special building to be erected in the large hospital grounds for the Toronto artificial limb factory; a home for 30 incurables has also been established in a former private residence in Toronto, the first of its kind for Canadian soldiers. There is also a training centre for masseurs at a mission-hall in Toronto. At Coburg the Ontario Military Hospital will have its capacity raised from 144 to 275 by the erection of new buildings reserved for curable cases of shell shock and other nerve troubles. By the acquisition of Pickering College, Newmarket, Ont., another hospital for the insane has been established for 150–200 returned soldiers. At Moosejaw, Sask., the Ross Park School has been secured, and with two auxiliary buildings in the grounds will take 400 men. In Saskatoon, Sask., the handsome building of the Y.M.C.A. has been taken over for 158 men. At Edmonton, Alta., the College is being taken over from the Methodist authorities, and will accommodate 300 men. Near Vancouver, B.C., two school buildings are being transformed for 450 men, 50 acres of land being available for farming and other purposes. Near Victoria, B.C., a charming beach hotel is already occupied, and the accommodation is being increased from 125 to 225. At Sydney, on Vancouver Island, the rest-haven is being increased from 160 to 200.

At the ports of arrival great improvements are being made for men immediately on their arrival from overseas. At Halifax, N.S., a clearing hospital with 450 beds is already in use, part being reserved for tuberculous patients; the provisions for attention and care there are excellent, as well as on the hospital trains. At Quebec, the clearing depôt, formerly the immigration building, is being remodelled, and will house 1000; special accommodation has been set apart for cases of tuberculosis and mental derangement.

Altogether between 500 and 600 workmen are now at work on the various buildings mentioned for reception, treatment, and training of the returned Canadian soldiers.

The bodies entrusted with the duty of watching over the interests of discharged soldiers are the Military Hospitals Commission, the Provincial Commissions, and the Board of Pension Commissioners. The problem of securing the proper return of discharged and disabled men to civilian life will be made less difficult if a knowledge of the duties of these bodies and of the measures by which disabled men are cared for becomes general. The medical profession in Canada is performing a work of public value by spreading a proper understanding of these matters, and convincing soldiers and civilians alike that it is the duty of disabled men to accept all that treatment and training can do for them.

Toronto, May 1st.

THE CONTROL OF VENEREAL DISEASES.

Treatment of Venereal Diseases in Belfast.

ON June 6th, at a meeting of the board of management of the Royal Victoria Hospital, Belfast, it was unanimously decided to form a special department for the treatment of venereal diseases, as suggested by the medical staff.

The American Journal of Syphilis.

The second number of this new journal has reached our hands. It is published quarterly by the C. V. Mosby Company, of St. Louis (801–807, Metropolitan Buildings, St. Louis, Mo. Yearly subscription $5, or $5.80 in foreign countries), and edited by Dr. LoydThompson, of Hot Springs, Ark., assisted by an associate editor and 15 departmental editors, among whom may be noted the names of H. Noguchi (New York), E. L. Opie (St. Louis), L. F. Barker (Baltimore), and Major C. F. Craig, of the United States Army. On the cover appears a quotation from Sir William Osler: "Know syphilis in all its manifestations and relations and all other things clinical will be added unto you." This number contains nearly 250 pages of text, mostly devoted to original articles, the first of which is a reprint of Dr. Noguchi's Harvey lecture on spirochætes, an exhaustive study of the natural history of all known varieties of this group, containing a bibliography of 283 publications. Dr. F. Proescher and Dr. H. A. Seil (Pittsburgh, Pa.) contribute a long paper on the action of vanadium with particular reference to syphilis, basing their conclusions on experimental work with animals. A supplementary clinical contribution by Dr. A. W. Stillians (Chicago, Ill.), who used sodium hexavanadate in doses of 0·03–0·06 gm. intramuscularly or intravenously in cases of primary and secondary syphilis at a dermatological clinic, contains the conclusion that the salts of vanadium have a specific effect on syphilis, clearing up the clinical manifestations and favourably affecting the Wassermann reaction. Other papers deal with serological reactions and clinical cases. The number ends with an abstract of current syphilis literature edited by Dr. W. H. Deaderick (Hot Springs, Ark.), including, however, only four extra-American out of a total of more than 50 articles. The character of this journal amply justifies its appearance, and its issue should be a useful adjuvant to the campaign against syphilis.

Correspondence.

"Audi alteram partem."

WAR EMERGENCY FUND OF THE ROYAL MEDICAL BENEVOLENT FUND.

To the Editor of THE LANCET.

SIR,—The time has come to make a further appeal for the War Emergency Fund. This fund was instituted last year to afford assistance to members of our profession who, in consequence of having joined the Army Medical Service, find themselves in temporary difficulties. Many medical men when called up had to leave on very short notice, without time to make adequate provision for the continuance and maintenance of their practices during their absence. As the result they have had to face a severe fall in income even when supplemented by Army pay, while many expenses, such as rent, insurance, taxes, family maintenance, and education, could not be reduced. Although in a year or two after their return it may be hoped those affected will recover their position, still in the interval that help is and will be necessary, and it is to meet these needs that the War Emergency Fund was established.

To be effective the grants must be made on a liberal scale, and the fund from which they are to be drawn must be a large one. The sum obtained last year was about £4000. This is quite inadequate, as at least £25,000 will be required, if even a small proportion of those requiring assistance is to be helped. From the wealthier members of the medical profession, it is hoped, substantial sums will be received, but everyone will feel it a duty which he owes to his less prosperous colleagues to give the most liberal donation he can afford.

At the same time the appeal is not, and ought not to be, restricted to the medical profession. The public, too, may be rightly called upon to bear its share, and to show by liberal contributions its appreciation of the special services so freely rendered by the medical profession to the country.

The War Emergency Fund is a special department of the Royal Medical Benevolent Fund. It is kept separate and distinct from the ordinary operations of the general fund and is under the management of a committee specially appointed for the purpose. Communications should be addressed to the Honorary Secretary, War Emergency Fund, 11, Chandos-street, Cavendish-square, W. 1, to whom cheques should be made payable.—We are, Sir, yours faithfully,

SAMUEL WEST, President.
CHARTERS J. SYMONDS, Hon. Treas., Col., A.M.S.
June 9th, 1917. G. NEWTON PITT, Hon. Sec., Major, R.A.M.C.T.

THE ANTISEPTIC "FLAVINE" (ACRIFLAVINE).

To the Editor of THE LANCET.

SIR,—Under the above heading an official statement by the Medical Research Committee appeared in your journal last week. As the original publication concerning "Flavine" was made from this department and based on work by several members of the staff (Browning, Gulbransen, Kennaway, and Thornton [1]), the unfortunate impression might be created unintentionally in the minds of those reading the Medical Research Committee's statement that we had neglected to acknowledge its share in furthering this work. I would, therefore, add to what it has said that when after the outbreak of the war it seemed to us that further investigation on antiseptics was urgently required, the Medical Research Committee was approached with a view to securing its support for this department of the Middlesex Hospital on the subject, and we met with most cordial interest, the first material outcome being that the Committee provided the emoluments of one part-time worker. As a result of the combined facilities afforded by the Hospital and by the Medical Research Committee it was possible to resume work on the lines of that which had been done by myself along with Gilmour [2] in Professor Muir's department at Glasgow University some years ago and before this country enjoyed the benefit of the operations of a State Medical Research Committee; thus we were able here to develop the investigation with a view to a practical application in the treatment of infected wounds. The introduction of Brilliant Green as an antiseptic in the treatment of wounds by Leitch [3] appears to have been a valuable practical outcome of attention drawn to this substance by our earlier work, and we have also recommended "Flavine" ("Acriflavine") as a result of the continuation of this work, the original experimental part of which was carried out here with a sample which had been supplied to us under the auspices of the late Professor Ehrlich in 1912. The Department of Biochemistry and Pharmacology of the Medical Research Committee has been especially helpful by preparing the latter compound, and so affording a considerable quantity for clinical trial of what, up till recently, we believed to be the most valuable member of this group; in this way they supplemented our slender store of somewhat less suitable compounds of the same type (acridine dyes), although the latter, judging by the opinion of Colonel Pilcher, D.S.O. (see Browning, Gulbransen, Kennaway, and Thornton,[1] also James [4]) and the report by Dr. Ligat,[5] also proved valuable clinically. The assistance afforded by the Medical Research Committee, as well as by the Royal Society's Scientific Grants Committee, towards this work of the Bland-Sutton Institute was acknowledged in the only publication which we have made. It is, of course, almost unnecessary to say that neither the staff of the Institute nor the Hospital has been concerned in any way with the production and supply of "Flavine." The Medical Research Committee's Department of Biochemistry and Pharmacology has since then continued to give us valuable aid, especially by providing an experimental supply of "Proflavine" (the basic constituent of which had been examined by Browning and Gilmour [6]). We have had no opportunity of acknowledging the latter, as we have as yet made no publication on the investigation of its properties. However, the tribute to the Committee's aid paid by Sir John Bland-Sutton in his speech at a recent quarterly meeting of the Board of Governors of the Middlesex Hospital and widely published in the daily press prior to the appearance of the Medical Research Committee's official communication, would appear to have anticipated the latter in a generous and sympathetic correction of any erroneous impression which might have existed anywhere in the public mind.

I am, Sir, yours faithfully,

C. H. BROWNING.

Bland-Sutton Institute of Pathology, Middlesex Hospital, June 11th.

*** Since receiving Dr. Browning's letter the following communication has reached THE LANCET from the Medical Research Committee:—"By the courtesy of Dr. Browning the Committee have had an opportunity of seeing the foregoing statement. They would entirely confirm the accuracy of the account Dr. Browning gives. Their communication to the lay press last week was made to correct so far as possible the results of recent statements made in the lay press which were based upon misapprehension of the present situation in regard to the properties and the supply of Acriflavine, and must have been an equal source of embarrassment to all concerned. They would greatly regret that their communication should be read in any other sense."

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—The last course of Lumleian lectures [1] relates without comment the transition from the purely myogenic conception of the excitatory mechanism of the heart, entertained not long ago by the new cardiologists, to the neuro-myogenic now gaining favour. The lecturer duly erects the familiar back-pressure ninepins in the new cardiological bowling-alley, of which the neo-cardiologist appears to be capable of entertaining only one conception, and proceeds to knock them over with his modern aspect bowls of cardiac failure. He makes no more sufficient reference to the influence of the mechanical valvular factor in the circulation than did Sir James Mackenzie, the Oliver-Sharpey lecturer in 1911, although some remarks of the latter in his letter in THE LANCET of May 26th suggest that his horizon has been somewhat widened on this point since that not very distant date. Questions of blood weight, blood pressure, and the relative influence of the arterial

[1] Brit. Med. Jour., Jan. 20th, 1917.
[2] Journ. of Path. and Bact., vol. xviii., 1913, p. 144.
[3] Brit. Med. Jour., Feb. 12th, 1916.
[4] R.A.M.C. Journ., March, 1917.
[5] Brit. Med. Jour., Jan. 20th, 1917.
[6] Loc. cit.
[1] The Lumleian lectures were published in THE LANCET of March 17th, 24th, and 31st.

and auriculo-ventricular valvular apparatus are not considered by Dr. G. A. Sutherland, while the differing conditions of the right and left cardiac circulation are quite inadequately dealt with, and in so far as they are considered at all, their concern with any specially modern aspect of heart disease is not obvious. He criticises at length some conclusions of Professor A. R. Cushny on the action of digitalis (to which Sir James Mackenzie also seems to refer in his letter in THE LANCET of May 26th) which do not quite square with a current conception of the new cardiology—that, namely, which denies the direct tonic action of the drug on cardiac muscle; makes, it will be admitted, no very generous reference to the contributions of previous workers; and concludes somewhat interrogatively by expressing the hope that he may convey to the rising generation of new cardiologists the benevolent regard of the venerable Fane of Harvey.

As I have said, in all this there is nothing very striking, original, or generous, yet this course evinces a peculiar resurgent property for discussion, as though it were the stalking horse of a propaganda in an unsympathetic atmosphere. The protagonist of the Newer Thought himself, in your issue of May 26th, now trundles another ball down the resounding alley already mentioned, to demolish the last standing pin of previous aspects of heart disease, with some added generalisations upon the philosophy of reaction and progress, implying, of course, a monopoly in the search of truth for those whom he regards as progressive. It is not my intention to follow him over the whole course of his remarks, or to consider either the novelty or utility of the semeiological index to the fruitful research of the future, on which he dilates. One appears to have been engaged in this research more or less all one's lifetime, but from the distinction which Sir James Mackenzie draws between the microscopist and the clinician I gather that he thinks more attention should be paid to the living phenomena of disease than to their explanation by ultimate results in structural change. In this connexion an excellent lecture by Peter Mere Latham (*b.* 1789) may be read with advantage (Heart Disease, Lect. IV.). I shall restrict myself to the consideration of that aspect of the question with which Sir James Mackenzie associated my name in his letter—namely, the significance of murmurs—and hope, if my matter does not convince him and his school of thought, that my manner may be controlled by the spirit of the first and greatest of the aphorisms of the Father of Medicine, the immortal first clause of which forms the motto of the Royal College of Physicians.

Is not this persistent attack upon back-pressure conceptions based upon a misinterpretation of symptoms and a misapprehension of the views of the majority of physicians for at least a generation? For what is back-pressure? Is it not the result of the retention in some degree in the heart, of blood which should be more easily projected from it? When Dr. Charles Bolton in his recently related experiments[2] produced ascites by partially ligaturing the inferior vena cava in cats, did he not produce as an immediate result back-pressure in an acute degree? For what purpose does the staircase of venous valves exist except to enable the blood to climb against gravitation during the diastolic pause in propulsion in one section of circulation and to prevent systolic back-pressure in another section? That the *vis a tergo* failing renders the climb of the blood more difficult is surely not a new discovery. From a study of the quadruped as compared with the biped circulation I showed in 1878[3] how the horizontal required a more powerful left ventricle than the erect animal, to produce an easy transit of blood, and failure of left ventricular force does not act solely by the diminution of propulsive, but also by the lessening of absorptic power with delay or rise of pressure in the pulmonary circuit and the right heart.

A young man, otherwise healthy, eats a heavy supper, vomits, complains of pain in the chest, becomes pallid, and dies within an hour. On examination the utility, even of the pulmonary arterial valves, is vindicated by the proof of their having ruptured and caused rapid venous stagnation and death. Similarly the sudden rupture of any valve or its attachments disorganises a heart much more rapidly than when the valve defect is slowly established and with it a compensatory hypertrophy of muscle takes place.

Another man with a much stenosed pulmonary arterial orifice and shrunk, but hypertrophied, right ventricle lives to be a septuagenarian, notwithstanding a universal adhesion of the visceral and parietal layers of the pericardium, *because* he has a specially large patent foramen ovale and the valvular apparatus of the left heart is sound.

If one desires to see an incontestable picture of cardiac back-pressure in a less acute degree than that produced by valvular rupture or experimental ligation, let him examine the radiogram of a tightly stenosed, buttonhole, mitral valve with dilated and unemptied left auricle and loudly accentuated pulmonic second sound. This condition may prove suddenly fatal without any indication of auricular fibrillation or any evidence of ventricular failure other than the final and unexpected syncope which terminates life.

Physicians who did not live to see the dawn and day of the modern aspect of heart disease believed that in time, sometimes in one way, sometimes in another, the driving ventricle failed to cope with the cumulative effect of blood retention or back-pressure, the failure being either gradual with the usual retrograde evidences of the triumph of stagnation over motion, or sudden and without any such manifestation. Within the memory of at least a generation only ventricular failure has been regarded as the cause of such disaster. Is there any other or better elucidation of the situation now? The very hypertrophy attending all increased difficulty in evacuating the heart, which we know is greater in some forms of valvular defect than in others, teaches the same lesson, and the failure to cope with the difficulty may arise now in one way and again in another. It may be by the gradual waning of force in a once "compensated" but later hypotonic or degenerated myocardium, by the exhaustion of the heart by some intercurrent myocardial storm, and at times apparently by inhibitory arrest or by starvation of the coronary circulation. The tachycardial heart may result in dilatation of the left ventricle with the development of well-marked mitral reflux declared by an unmistakable bruit of bicuspid incompetency, or in the small and contracted ventricle which has outrun its blood-supply, as shown by accumulated stagnation in the pulmonic circuit and venous heart and by the small empty left chambers of the organ, as in death from asphyxia or hæmorrhage.

Since, however, the question of cardiac adequacy was first mooted in the medical press, chiefly in connexion with recruiting for war, that of valvular disease as affecting the war-worthiness of the heart in the soldier has been considerably simplified for the neo-cardiologist, although it probably will be still more so for him if the war lasts a little longer.

I have stated how the adequate consideration of the subject was not entered upon either by the Oliver-Sharpey lecturer of 1911 or the Lumleian lecturer of 1917. Experience has, however, driven the new cardiologists[4] to advise a preliminary exclusion of recruits showing evidence either of regurgitant aortic disease or of mitral stenosis. If Sir James Mackenzie is in agreement with this conclusion he has changed his ground since his previous declaration of the innocuousness of mere valvular lesion in the presence of adequate ventricular force. That he has had the courage of his opinion, I know, for I have myself advised the rejection of candidates with aortic disease, both for the Army and for life insurance, whom he has considered suitable for both purposes. THE LANCET has also (July 22nd, 1916) in a leading article dealt with the responsibility involved in allowing recruits with aortic regurgitant disease to serve, and in a letter in THE LANCET (August 5th, 1916) on the soldier's heart I gave demonstrable evidence of the importance of the aortic valve in maintaining the circulation of the blood. This looked rather like forcing an open door, but some of the paradoxes of the new cardiology have made almost any discussion in cardiac matters more or less relevant, and have led to the restatement of many points once regarded as securely accepted. Even now the findings of the Report mentioned require comment. "The question," it says, "is not one of diagnosis but of prognosis. A man with stationary aortic disease may be capable, and often is capable, of far greater and more prolonged strain than is a man who with severe symptoms of the kind described has no murmur." In other words, that we are justified in gambling with the stability of a radically injured heart because it is at the moment in less parlous state than a heart inadequate from some other cause, native or acquired. This is an utterance very characteristic of the school from which it issues, which is apparently still obsessed by the disproportionate value it attaches to the

[2] Oliver-Sharpey Lectures, Brit. Med. Jour., May 19th.
[3] Edin. Med. Jour., 1879-80.
[4] Report of Medical Research Committee, No. 8, p. 7 et seq.

muscular factor in the circulation. It is some evidence, however, of a return to the appreciation of the truth in older aspects of heart disease that the new cardiologists should have conceded so much, and, as is their manner, unobtrusively, changing ground with as little acknowledgment of having abandoned a previous position as is possible. In view of the action taken in this Report, the matter raised in Sir James Mackenzie's letter of May 26th, with which I am now concerned, may be regarded as so far simplified that consideration may be limited to those cases which the authorities in question still allow to enlist and serve—namely, those showing systolic bruits at the base or apex of the heart, for the discrimination of which, as organic or functional, they consider auscultation to be a fallacious method of investigation. With a certain obvious modification, due to the difference between the exigencies of the soldier's life in war and the civilian's in peace, the considerations involved apply to both classes.

The first point to determine is whether the systolic bruit manifested in a given case is exo- or endo-cardial and what its potentialities are for affecting the action of the heart. In my letter in THE LANCET of April 14th last I stated that "many systolic bruits, transient or exo-cardial in nature, which are usually easily diagnosed and have frequently been fully appreciated, are, of course, negligible." Sir James Mackenzie asks me three questions in consequence: First, where he may learn that negligible cardiac bruits may be distinguished from those that are not negligible; second, where I can point to a single instance in which with clearness and precision directions are given for making this distinction; and third, where the principles for assessing the value of murmurs are to be found.

It is evident from these questions that he has missed the point of the statement I have quoted, as an organic endocardial bruit is never transient, except in some cases of recent endocarditis or in the presence of some degree of actual cardiac failure, when it may disappear for a time to return in the heart that has regained power, if it ever does so. His question ought to have been how organic were to be distinguished from inorganic or functional endocardial murmurs, and both these from exocardial bruits or noises. This, I stated, had frequently been pointed out and done.

That essentially inorganic non-valvulitic bruits are met with which it is impossible to distinguish while they last from valvular lesions is within the knowledge of all who have had any considerable experience of these matters. But such only occur in the presence of quite evident cardiac failure and are always systolic and apical. They never occur in the recruit or in those in ordinary health, and they may, as I have said, disappear if there is recovery of cardiac power. The physiological tricuspid leak to which Sir James Mackenzie has referred never gives bruit unless the impediment in the dextrocardial circulation is pathological, as in pulmonary embarrassment by emphysema or other cause and in the atonic hearts of some young people. The only exceptions to the apical position and systolic time of the functional endocardial bruit are the rare cases in which a pulmonary valvular diastolic bruit is met with in the presence of a well-marked mitral lesion with raised pulmonic pressure, which is surely back-pressure, and in some cases of high arterial blood pressure with a forced gape in the sigmoid valves. The inconstancy of these murmurs alone reveals their inorganic character. Such cases have, of course, no bearing upon the selection of hearts for any active occupation. The *exocardial* bruit is also systolic in time, whether at the base or apex of the heart, except when it shows the double-shuffle of a pericarditis.

Exocardial bruits and the transient endocardial bruits met with in apparently healthy and usually young subjects I need scarcely say, and I think Sir James Mackenzie will agree with me, are easily diagnosed by altering the posture of the person who manifests them and by noting the effect upon them and their relation to respiration. As such they have surely been frequently appreciated and have presented little difficulty in diagnosis by that instrument, discredited by the Report to which I have referred—namely, the stethoscope.

In the case of the soldier I maintain that *no* organic valvular lesion is negligible, although there may be degrees in the gamble with life and efficiency, if one passes some mitral reflux and direct aortic cases. To do either I hold to be unjustifiable, while to pass cases of mitral stenotic or aortic reflux lesions occurring in any degree whatever should be characterised in stronger terms. Those who would even think of passing such cases are only likely to be found among the so-called neo-cardiologists, and a chastened experience appears to be in the course of enlightening even them, if we may judge by some of the findings of the Research Committee's Report.

With the civilian the case is not quite the same as with the soldier. For the purposes of life insurance there are few organic valvular lesions which should be passed except in some cases for short periods and then with the risk recognised. But, as we all know, the civilian who is not called upon for strenuous effort may occasionally carry an organic valvular lesion through a long and not inactive life. So far as my own experience goes, the aortic orifice is always sound in such cases and the lesion mitral and reflux. Rare cases, such as that of the malformed heart I referred to, which survived to old age, are quite exceptional and explicable by anatomical conditions, which only emphasise the importance of the valvular factor in heart disease, and the necessity for reckoning with it in prognosis. The value, moreover, of the careful study of the timbre or note of an organic valvular murmur in a given case in which a standard of its audibility and pitch has been established may provide a gauge of the power of the chamber or chambers of the heart producing it. This point was early impressed upon me, and I have referred to it in various papers and publications. It has also been noted by others.

I hope I have now shown that the bruits I characterised in my "oracular" utterance in THE LANCET of April 14th as negligible and as having frequently been appreciated were exocardial bruits and those functional endocardial bruits which disappear or are markedly modified on exertion or change of posture and which are at times abolished by deep respiration. Sir James Mackenzie evidently desired to learn the criteria for the full appreciation of organic endocardial or valvulitic bruits. That is another matter, but may approximately be done, as many writers have pointed out. Perhaps among recent authors the late Sir William Broadbent dealt with the point most fully, although it has not been overlooked by others. One of the best writers on the auscultation of the heart was Peter Mere Latham, whose work on heart disease, published by the New Sydenham Society, with an introductory memoir by that master of pure English, Sir Thomas Watson, will always be worthy of perusal. The appreciation of organic murmurs can, however, only be approximately attained by attention to such considerations as their site, the character of the pulse, the changes in one or more chambers of the heart, and the auscultatory evidence, or absence of evidence, of tension in the pulmonic circuit. With these interesting topics I am not at present concerned, although I have incidentally had to touch upon them in maintaining the importance of the valvular factor in heart disease against exponents of the new cardiology.

I am, Sir, yours faithfully,

ALEXANDER MORISON.

Upper Berkeley-street, W., June 2nd, 1917.

AURICULAR FLUTTER DISCOVERED BY RADIOSCOPY.

To the Editor of THE LANCET.

SIR,—I anticipated that one or more of our English radiologists would have made some remarks *re* the annotation in THE LANCET of May 26th concerning auricular flutter as seen by the radioscopic screen. It is already well known that this phenomenon may be clearly recognised under the rays and the proportion 1 : 3 or 1 : 2 easily determined, and this is taught in continental text-books on radiology, and in particular in those written by our French confrères. In October, 1915, a young soldier was brought into the X ray room at the East Sussex Hospital, Hastings, who appeared very nervous of the rays. The heart showed an obvious right auricular flutter with a rhythm of 3 : 1, which disappeared after 15 minutes, and was quite obvious to those standing round. Although I examined him on several occasions afterwards I never caught it again. So far as I know, this is the first time that a neurotic or functional auricular tachycardia has been noticed. The ordinary form of heart-block in the aged and the disturbance of rhythm produced by extrasystoles are generally clearly seen on radioscopic examination.—I am, Sir, yours faithfully,

WALKER OVEREND, M.A., M.D. Oxon.,
Chief Assistant, X Ray Department, St. Bartholomew's Hospital, and Honorary Radiologist, East Sussex Hospital.

St. Leonards-on-Sea, June 6th, 1917.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Major A. V. Honman, Australian A.M.C.

Previously reported Missing, believed Drowned, now reported Drowned.

Capt. G. C. B. Hawes, R.A.M.C. (see THE LANCET, April 21st, 1917, p. 629).
Lieut. J. Naylor, R.A.M.C. (see THE LANCET, May 12th, 1917, p. 739).

Wounded.

Capt. S. S. Greaves, R.A.M.C.
Capt. B. C. Tennent, R.A.M.C.
Capt. F. P. Fisher, R.A.M.C., attached K.R.R.C.
Capt. A. G. M. Middleton, R.A.M.C.
Capt. A. H. Smith, R.A.M.C.
Col. F. S. L. Ford, C.M.G., Canadian A.M.C.
Lt.-Col. C. P. Templeton, Canadian A.M.C.
Capt. E. D. Gairdner, R.A.M.C., attached Rifle Brigade.
Lieut. F. G. Hack, R.A.M.C., attached Rifle Brigade.
Lt.-Col. A. E. Hodder, R.A.M.C.
Capt. R. W. Smith, R.A.M.C., attached Hussars.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who are reported to have fallen during the war :—

Second Lieut. F. M. Sutcliffe, London Regiment, killed in action, was the third son of the late Dr. J. Sutcliffe, of Clapham, Surrey.
Second Lieut. R. M. Hamilton, Cheshire Regiment, accidentally killed abroad, was the fifth son of Dr. Hamilton, late of Chester.
Second Lieut. (acting Capt.) D. W. Tonking, Duke of Cornwall's Light Infantry, died of wounds, was the son of Dr. J. H. Tonking, of Camborne, Cornwall.
Major R. Bolster, M.C., Royal Artillery, killed in action, elder son of the late Surgeon-General T. Bolster, R.N.

MENTIONED IN DESPATCHES.

The following are mentioned in a despatch, dated June 12th, 1917, dealing with operations near Basra in April, 1915 :—

Lieut. N. S. Jatar, I.M.S.; Temp. Lieut. W. B. Patel, I.M.S.; Capt. A. R. Thomas, I.M.S.; Asst.-Surg. (4th class) M. J. Nicholas, I.S.M.D.; Senr. Sub-Asst.-Surg. (1st class) Azhar Husain, I.S.M.D.

FOREIGN DECORATION.

French.

Médaille d'Honneur des Epidémies en Argent.—Temp. Capt. (temp. Maj.) A. G. Whitehorne-Cole, R.A.M.C.

THE ARTIST AT THE FRONT.

Part I. of Vol. II. of Mr. Muirhead Bone's drawings, issued from the offices of *Country Life* and Messrs. George Newnes under the title of "The Western Front," has the same high standard of imagination and technique as its predecessors. The larger proportion of the etchings are coloured, with very pleasing results. It will be noticed that Mr. Muirhead Bone, after his visit to the munition works and the Grand Fleet, has returned to France, as the current issue of "The Western Front" is devoted to the battle of Arras, with illustrations of Bapaume, Peronne, Thiepval, and other points of interest in the great advance. The prefatorial description of the battle of Arras forms one of the finest stories of a battle that we have ever read even in these days of journalism through the medium of pens of acknowledged distinction dealing with unrivalled opportunities. We cannot attempt to single out for particular notice any of the pictures.

HOSPITAL FOR LIMBLESS SOLDIERS.—Princess Louise has recently opened Erskine House, near Glasgow, as a hospital for limbless soldiers with accommodation for 400 patients. Some 450 men have been already provided with limbs manufactured by Scottish labour. About £200,000 has been raised for equipment and endowment of the hospital.

BATTALION SANITARY STANDING ORDERS.

THE article which follows has been contributed by Captain H. W. BAYLY, R.A.M.C. (T.), M.R.C.S., L.R.C.P. Lond. :—

The regular officers of the Royal Army Medical Corps receive a thorough and practical education in sanitation and hygiene, but circumstances do not usually permit Territorial or temporary medical officers to acquire a similar knowledge and experience. Many general practitioners or recently qualified men join the Royal Army Medical Corps as temporary officers and become attached to battalions with but a hazy idea as to the scope of their duties and with a very superficial knowledge of the contents of the admirable handbooks on the subjects of sanitation and hygiene provided and issued by the Army medical authorities.

Sanitary Duties of Battalion Medical Officers.

The temporary Royal Army Medical Corps officer often leaves his practice with the idea that sanitation is the work of a specialist and that his army duties will consist of attending to regimental sick and dressing wounded under fire. He usually quite fails to realise that his most valuable and important work may lie in the path of preventive medicine.

It is of the utmost importance that he should realise his position as the last link in the wonderful chain of practical science and administrative organisation between the private soldier and the Director-General of the Army Medical Service. Headquarters do everything possible to ensure efficient sanitation of the different sectors, and the most up-to-date orders are issued supplementing the excellent orders and regulations contained in the handbooks; but the final responsibility very largely remains still with the battalion medical officer. He alone is in a position to see that these orders and regulations for the health of the men and the sanitation of the area occupied by them are carried out. He alone can obtain their active coöperation in this work.

However perfect such orders and regulations may be, they will avail nothing if the battalion medical officer fails to see that they are carried out. Only by the ceaseless care and energy of the battalion medical officer can efficient sanitation be enforced and maintained. Constant disappointment, frequent rebuffs, must not discourage him. Although he knows that as soon as he is beginning to get things straight his battalion will be moved somewhere else, still, he must remember that although his particular unit will not benefit from his labours the work is not lost, and some unit of the B.E.F. will benefit. He must never allow popularity to come for one moment before duty, and it is not always easy, especially for a young man, to insist on the necessity of some work which may not appear as a necessity to a non-medical mind burdened with responsibility of a purely military nature.

To most non-commissioned officers and men Army Orders, or even Divisional Orders, are remote from their life as a unit, and to them their battalion is their world. It therefore appears advisable that every battalion should have its own standing orders dealing with sanitation and hygiene. Such orders must be very simple and explicit or they will be evaded, and the excuse made that they were misunderstood, or ignorance will be pleaded. Lectures on sanitation must be given by the medical officer of the battalion by companies, in which the standing orders are gone through item by item, and the "why" and "wherefore" explained. The soldier must be made to see that the Standing Sanitary Orders are drawn up for his own good, and that they are not just the arbitrary and annoying whim of a faddy medical officer.

As battalion medical officers fall sick or become casualties their places are taken by others, and continuity in sanitary methods is liable to be interfered with; thus Battalion Standing Sanitary Orders would help in assisting continuity. Divisional orders dealing with questions of sanitation accumulate rapidly, and it takes some considerable time for a medical officer to master the voluminous file of old orders; also, especially during an attack, or if the medical officer and sick sergeant become casualties, the file of orders may be destroyed or lost, and a new medical officer would find the Battalion Standing Sanitary Orders a great help.

I drew up the following standing sanitary orders for rest camp, on the march, and trenches, and the commanding officer of the battalion to which I had the honour of being attached was good enough to have them published in Battalion Orders after they had received the sanction of my

Assistant Director of Medical Services. They are only an extract, in simple language that can be understood by the men, of the many admirable orders, rules, and regulations contained in the Army publications and orders. They are based on practical front-line battalion experience, and my hope is that they may serve as a useful guide to battalion medical officers who are new to their work. Doubtless they can be advantageously modified to meet varied circumstances and environments, but I think that if somewhat similar Standing Sanitary Orders were enforced in every battalion they would assist in the carrying out of the wishes of the higher commands as expressed in Army Corps and Divisional Orders.

BATTALION STANDING SANITARY ORDERS.

I.—REST CAMP.

A. *Conservancy.*

1. *Latrines.*—(*a*) *Type: Temporary.* Buckets or tins with post and rail seat. Front of tin to be 4 in. behind bar, with a tin gutter 8 in. broad leading from back of bar into tin. *Permanent.* Buckets with closed-in seats and with covers for holes. Where permanent latrines of other types have been constructed by previous units they may be used subject to the sanction of the medical officer. (*b*) *Disinfection:* Buckets or tins to be disinfected with chloride of lime. (*c*) Buckets or tins to be emptied at 8 A.M. and 3 P.M. and contents burned in closed destructor where possible, but otherwise buried at least 100 yards from any house, hut, tent, or bivouac. (*d*) Every man to cover excreta with dry earth (or sawdust where possible) after using latrine. (*e*) Men are strictly forbidden to relieve themselves except in latrines. (*f*) Latrine seat must be washed daily with cresol solution.

2. *Urinals.*—(*a*) Urine pits to be constructed according to orders of the medical officer. (*b*) One urine bucket or tin to be placed outside each hut or billet of every platoon for use during night only. (*c*) Urine tins to contain 3 oz. cresol solution. (*d*) Tins to be emptied into urine pits at 8 A.M. daily. (*e*) Men are strictly forbidden to urinate except into the tins, buckets, or urine pits provided.

3. *Incinerators.*—(*a*) *Type:* Where possible, closed incinerators of the Horsfall pattern should be built by the pioneers of the battalion for the destruction of excreta. They may be built of tins full of earth, puddled clay, and corrugated iron sheeting. Where excreta are buried, open incinerators may be used for the burning of rubbish. (*b*) One incinerator per company is required and one for headquarters. (*c*) Incinerators should be lit at 8 A.M. and kept well burning all day and fully charged before leaving duty at 4 P.M.

B. *Disposal of Refuse.*

1. *Food and hut refuse.*—(*a*) All remains of food, empty tins, rubbish, &c., to be collected immediately after each meal and placed in the receptacle provided. The platoon sergeant will be responsible for the collection of refuse. (*b*) The refuse receptacles will be emptied and contents removed by the sanitary squad at 9 A.M. and 2 P.M. and burned in the incinerator.

2. *Cook-house refuse.*—(*a*) A receptacle to be provided adjacent to each cook-house for the collection of "pig-tub" refuse. (*b*) Contents to be removed daily by local contract or to be burnt in the incinerator.

3. *Sullage water from cook-house.*—(*a*) A sullage pit of the type recommended by the medical officer to be made as near each cook-house as practicable. (*b*) The hay or straw filter-layer to be burned daily in the incinerator. (*c*) The sand, gravel, or ash filter-layer to be changed once a week and the touled material that is removed buried. (*d*) The sullage pit to be used for greasy water only.

4. *Horse-dung.*—All horse-dung to be removed daily, either (*a*) by arrangement with local farmers; (*b*) by burning in the incinerator; or (*c*) by burial in a pit or by being covered with a 6 in. layer of fresh earth.

C. *Water and Food.*

1. *Water* (drinking and cooking).—Men are strictly forbidden to drink any water, or fill their water-bottles with any water, or use any water for cooking purposes, except that obtained from the water-carts, unless by permission of the medical officer as published in orders.

2. *Food.*—(*a*) Rations will be issued by non-commissioned officer or senior soldier in charge of each section, only sufficient rations for each meal being issued at one time. (*b*) All unopened tins of food to be kept in a cool place until issued. (*c*) All bread, biscuit, cheese, sugar, &c., to be kept in a dust- and fly-proof receptacle until issued. (*d*) Meat (fresh) to be kept in a dust- and fly-proof safe until issued. (*e*) Tins only to be opened immediately before consumption of contents. (*f*) Any unconsumed food reserved for future consumption, or any food, chocolate, sweets, &c., contained in a parcel from home, to be placed in a dust- and fly-proof receptacle provided or in *closed* mess-tins.

D. *Fly Prevention and Destruction.*

(*a*) All refuse left by previous units must be collected and burned in the incinerator. (*b*) All foul ground from which refuse has been removed must be sprayed with cresol solution or with a vermorel spray. (*c*) All wooden or paved flooring must be brushed out daily and washed once a week with cresol solution.

E. *Personal Cleanliness.*

1. *Ablution places.*—(*a*) To be washed down daily. (*b*) The soapy water to be directed by open drains into two pits in series separated by a trap. The first or cleansing pit to contain chloride of lime and the effluent to be run off from 9 in. below the surface of the scum into the second or soakage pit. (*c*) The scum to be skimmed off the cleansing pit at least once a week and fresh chloride of lime added.

2. *Baths.*—(*a*) *Permanent:* When possible every man will have at least one hot bath per week. Platoon sergeants will be responsible that the bath rolls of their platoons are correctly kept. (*b*) *Temporary:* Where permanent baths are not provided a temporary bathing place will be, if possible, established and use made of the local tubs and coppers that are available. This bathing place must be trenched and drained into two large sullage pits in series as with ablution places. (*c*) *Bathing parades:* In rivers, streams, &c. Platoon sergeants will be responsible that the rolls for such parades are correctly kept.

3. *Washing and sterilisation of underclothes and blankets.*—(*a*) Shirts, vests, and pants should be washed at least once a fortnight; socks must be washed once a week. (*b*) These articles should, if possible, be sterilised in a steam steriliser once in six weeks. (*c*) In fine weather blankets must be exposed to sun and wind for at least one hour daily.

F. *Ventilation.*

1. *Billets.*—All windows to be kept wide open day and night during summer months except on weather side during a rain-storm. During winter months windows to be kept wide open for at least one hour daily.

2. *Huts.*—(*a*) Windows and ventilators to be kept open day and night. (*b*) During windy weather in winter, if the hut contains windows on two sides, those on the weather side may be closed. (*c*) If the hut has loose tarpaulin sides these will be raised for at least one hour per day unless there is heavy rain and wind. (*d*) Windows or ventilators must not be blocked with sacking or other obstacle to free ventilation.

3. *Tents.*—(*a*) Walls of tent to be rolled up during day when tent is unoccupied except during heavy rain or wind. (*b*) During fine warm weather tent door to be kept open at night.

II.—ON THE MARCH.

A. *Latrines.*—(*a*) At every place where the battalion stops for an hour or longer shallow trench latrines of the 1 × 2 × 3 type should be dug by the sanitary squad in the proportion of one for every company and one for headquarters. Latrines must be filled in before proceeding. (*b*) During short halts or when a man has obtained permission to fall out on the march to relieve himself, he should dig a small hole with his entrenching tool, and after easing himself should fill in the hole with earth.

B. *Urination.*—(*a*) At every place where the battalion stops for an hour or longer an open urine pit 3′ × 3′ × 3′ should be dug out and filled in before proceeding. (*b*) During short halts or when a man has obtained permission to fall out to pass water he should be careful not to urinate within 50 yards of any pump, well, stream, reservoir, or pond. (*c*) If the battalion falls out in a village the men should make use of the public urinals provided by the military or local civilian authorities.

C. *Refuse.*—All remains of food, empty tins, &c., must be collected and buried in the urine pits and latrine trenches before proceeding after a rest for meals.

D. *Water.*—(*a*) No water to be drunk under any circumstances whatever except from the water-bottles carried. (*b*) No water to be drunk without the permission of an officer. (*c*) No water, other than water-cart water, to be used for cooking unless the permission of the medical officer has first been obtained.

III.—IN THE TRENCHES.

A. *Conservancy*

1. *Latrines.*—(*a*) *Type:* Tins with bar and gutter as in temporary rest camp. (*b*) *Disinfection:* As in rest camp. (*c*) Tins to be emptied into a shell hole, or other pit, at least 20 yards from trench, and covered with 1 foot of earth. (*d*) Latrine tins to be emptied and contents buried once every day and during hours of darkness only. (*e*) Every man to cover excreta with dry earth after using latrine. (*f*) Men to be strictly forbidden to relieve themselves in unused communication trenches or anywhere except in the latrines provided. (*g*) Latrine seats must be washed daily with cresol solution. (*h*) Occupied trenches to be provided with latrine accommodation every 300 yards. Communication trenches to be provided with latrine accommodation every 600 yards.

2. *Urinals.*—(*a*) Only water-tight tins to be used. (*b*) Tins to be raised up so that top level is 2 feet above ground level. (*c*) Tins to be disinfected with 3 oz. cresol solution. (*d*) Tins emptied as with latrines. (*e*) Accommodation as with latrines. (*f*) Men strictly forbidden to urinate in unused trenches, or anywhere except in the tins provided.

B. *Disposal of Refuse.*

(*a*) All refuse, empty tins, remains of food, &c., to be collected after each meal and placed in sandbag provided. Refuse must *not* be thrown over parapet or parados. (*b*) Refuse bags to be buried every night. (*c*) Any rubbish heap or foul ground that smells or attracts flies must be sprayed with creosol solution or a vermorel spray, and covered with fresh earth. (*d*) All refuse of any kind left littering the parapet, parados, or ground within 20 yards of a trench by previous occupiers of the sector must be removed and buried as soon as reasonably possible. (*e*) All greasy or soapy water must be poured into a hole and covered with fresh earth.

C. *Water and Food.*

1. *Water.*—(*a*) Men are strictly forbidden to drink any water or to fill their water-bottles with any water, except that supplied for their use by tank, pipe, or water-cart. (*b*) Well or pump water from adjacent houses must not be used for cooking unless the permission of the medical officer has been first obtained.

2 *Food.*—(*a*) Tins only to be opened immediately before consumption. (*b*) Any unconsumed food reserved for future consumption to be placed in a dust- and fly-proof receptacle, such as a closed mess-tin.

D. *Corpses.*

If, owing to position or decomposition, removal for burial is impracticable, the body, if within 30 yards of trench, must as soon as is reasonably possible be covered with 1 foot of earth or soaked with petroleum and burned.

ADDENDUM TO STANDING SANITARY ORDERS.

IV.—DUTIES OF SANITARY PERSONNEL.

1. The sanitary squad will be under the orders of the medical officer.
2. Routine hours of work in rest camp shall be 8 A.M. to noon and 2 P.M. to 4 P.M.
3. During the hours of work no man may absent himself from his duties.
4. Members of the sanitary squad will be excused all parades and fatigues with the exception when in trenches, of ration, water, and trench cleaning fatigues.
5. Two sanitary men alternately of each company will attend roll-call daily.
6. When on the march, in trenches, or on any special occasion (such as on arrival at, or departure from, a camp) the sanitary squad may be required to work before 8 A.M. or after 4 P.M.

7. Members of the sanitary squad will act as sanitary police and will report to the sanitary corporal, who will report to the medical officer, who will report to the officer commanding company every or any breach in the Battalion Sanitary Standing Orders, and they shall have authority to demand the name and number of any offender.

8. The medical officer will make a sanitary inspection of the camp or billets or trenches daily and instruct the sanitary corporal as to the work to be done.

9. The medical officer will give special lectures while in rest camp on sanitation to the sanitary squad at least once a month.

10. The sanitary corporal will be responsible to the medical officer for the carrying out of the Sanitary Standing Orders and the additional orders of the medical officer.

11. The medical officer will give occasional lectures on sanitation when in rest camp to the officers and men of the battalion, explaining the Standing Orders.

12. The duties of the sanitary squad shall consist of: (*a*) Preparing latrines, urine pits and tins, sullage pits, and refuse pits. (*b*) Attending to the same. (*c*) Collecting and burning all refuse and rubbish from the receptacles provided. (*d*) Disinfection of foul ground. (*e*) Reporting offences against Sanitary Orders.

Need of Constant Inspection.

In conclusion, I venture to insist on the urgent necessity of the battalion medical officer satisfying himself by daily inspection that his orders and the Battalion Standing Sanitary Orders are being carried out. It is quite useless giving orders if the orders are not backed up by frequent inspection. Nothing must be skipped, and it is as important to visit every trench latrine and dug-out as to make the daily round of billets and sanitary areas when behind the lines. The medical officer's daily visit to front-line trenches shows that he really believes in the importance of his teaching and helps to establish the friendly coöperation of the men. Unused communication trenches are apt to become insanitary if a watchful eye is not kept on them.

It is quite fallacious to think that a battalion medical officer has a lazy time except during a "push." On the contrary, if he performs all his duties efficiently he is busily employed nearly all his day, and especially so in rest camp, where his lectures on sanitation and first aid to officers, non-commissioned officers, and men, as well as to his own particular charges, the sanitary squad and stretcher-bearers, will be part of his routine week-day work. If a battalion medical officer complains that he is bored and has nothing to do, one can be very certain that he has failed to realise the scope of his duties and is not an efficient battalion medical officer.

RED CROSS GIFTS.—A menu card with drawings of penguins on the back by Captain Evans, of the *Broke*, has realised £1000 for the Red Cross. Mr. Walter Morrison has given a donation of £10,000 to the City of London Branch of the British Red Cross Society. £11,650 have been given by the British Farmers' Red Cross Fund for the purpose of meeting the expenses of the two hospital trains presented to the Red Cross by the Flour Millers of the United Kingdom.

URBAN VITAL STATISTICS.

(Week ended June 9th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 12·7, against rates steadily declining from 18·5 to 12·7 per 1000 in the eight preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 12·1, or 0·4 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 4·5 in Hornsey, 5·3 in Newport (Mon.), and 5·4 in Northampton to 20·4 in Walsall, 21·0 in Gloucester, and 23·0 in Sunderland. The principal epidemic diseases caused 348 deaths, which corresponded to an annual rate of 1·1 per 1000, and included 208 from measles, 61 from whooping-cough, 45 from infantile diarrhœa, 22 from diphtheria, and 6 each from enteric fever and scarlet fever. The deaths from measles were 37 fewer than in the previous week, and caused the highest annual death-rates of 3·3 in West Hartlepool and in South Shields, 3·6 in Sunderland, 3·9 in West Bromwich, and 4·5 in Middlesbrough. The 636 cases of scarlet fever and 1082 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 10 and 21 above the numbers remaining at the end of the previous week. Of the 4116 deaths from all causes in the 96 towns, 134 resulted from violence. The causes of 24 deaths were uncertified, of which 3 were recorded in Birmingham and in Sunderland, and 2 each in Stoke-on-Trent, South Shields, and Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 14·9, against rates declining from 17·0 to 16·0 per 1000 in the three preceding weeks. The 325 deaths in Glasgow corresponded to an annual rate of 15·2 per 1000, and included 37 from whooping-cough, 32 from measles, 3 each from diphtheria and infantile diarrhœa, and 1 from scarlet fever. The 110 deaths in Edinburgh were equal to a rate of 17·3 per 1000, and included 7 from whooping-cough, 6 from measles, and 1 from infantile diarrhœa.

Irish Towns.—The 141 deaths recorded in Dublin were equal to an annual rate of 18·4 per 1000, and included 3 from measles, and 2 each from whooping-cough and infantile diarrhœa. The 101 deaths in Belfast corresponded to a rate of 13·4 per 1000, and included 2 from whooping-cough, and 1 each from enteric fever, measles, and infantile diarrhœa.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING *Dec. 31st, 1916.*

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
Leicester	50	0·10	4·00	4·38	1·55	2·29	12·31	1·64	0·30	0·17
London—										
Meteorological Office	58	0·13	2·99	8·08	3·48	3·48	18·16	1·90	0·70	0·02
Embankment Gardens	39	1·28	3·53	6·74	1·47	3·19	16·20	1·79	0·68	0·05
Finsbury Park ...	65	0·05	0·54	1·17	2·73	4·66	9·15	3·17	0·64	0·05
Ravenscourt Park	62	0·34	2·40	5·24	3·98	8·31	20·26	5·49	0·60	0·09
Southwark Park	67	0·43	4·49	9·37	5·88	9·29	29·49	5·70	0·92	0·08
Golden Lane ...	60	0·12	2·93	3·84	1·69	5·31	13·89	2·42	0·94	0·18
Manchester—										
Queen's Park ...	73	—	—	—	—	—	18·00	—	—	—
School of Technology	80	—	—	—	—	—	21·00	—	—	—
Newcastle-on-Tyne	95	0·37	5·13	11·59	2·08	4·17	23·34	2·62	0·50	0·11
York	47	—	—	—	2·24	3·74	—	2·03	0·4	0·03
SCOTLAND.										
Coatbridge	72	0·25	2·97	6·33	1·34	1·89	12·78	1·40	0·31	0·13
Greenock	151	0·36	2·47	3·24	2·26	5·44	13·78	2·55	0·69	0·20

Jan. 31st, 1917.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
Leicester...	45	0·08	3·35	5·70	1·03	2·43	12·59	1·31	0·48	0·14
London—										
Meteorological Office	34	0·10	3·09	3·82	2·72	2·04	11·77	1·10	0·91	0·01
Embankment Gardens	26	0·11	1·01	1·68	1·12	2·11	6·02	1·30	0·39	0·03
Finsbury Park ...	31	0·05	0·98	2·05	0·81	1·88	5·76	1·04	0·29	0·02
Ravenscourt Park	31	0·13	1·11	2·78	1·18	2·40	7·59	1·49	0·33	0·04
Wandsworth Com.	26	0·02	0·66	2·46	0·93	1·79	5·86	0·91	0·40	0·02
Golden Lane ...	28	0·04	1·51	2·05	1·11	2·99	7·70	1·37	0·66	0·10
Malvern	33	—	0·33	0·72	0·64	1·98	3·68	0·74	0·25	0·01
Manchester—										
Queen's Park ...	44	—	—	10·20	—	—	13·30	—	—	—
School of Technology	49	—	—	14·02	—	—	18·40	—	—	—
St. Helens	55	0·21	4·51	2·06	0·21	11·34	18·31	3·80	1·08	0·16
Newcastle-on-Tyne	82	0·48	5·63	17·59	3·75	5·40	32·86	2·80	1·56	0·15
York	77	0·12	0·97	1·24	4·27	5·56	12·16	3·00	1·09	0·05
SCOTLAND.										
Coatbridge	63	0·20	1·59	3·67	2·14	2·93	10·53	1·93	0·39	0·15

There are no returns in these tables from Exeter, the work having been discontinued owing to the war, nor from the Metropolitan Stations, Victoria Park (December and January) and Wandsworth Common (December), on account of frost.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Deputy Surg.-Gen. P. B. Handyside to be Surgeon-General, and Fleet-Surg. W. Bett, M.V.O., to be Deputy Surgeon-General.

To be Temporary Surgeons: J. E. Jackson, J. E. G. McGibbon.

ARMY HEADQUARTERS STAFF: MEDICAL BRANCH.

To be Temporary Directors, Medical Services in India: Surg.-Gen. J. G. MacNeece, C.B., Army Medical Service; Surg.-Gen. T. J. O'Donnell, C.B., D.S.O., Army Medical Service.

ARMY MEDICAL SERVICE.

Col. A. E. Ross, C.M.G., Canadian A.M.C., to be Deputy Director of Medical Services, vice Col. G. L. Foster, C.B., Canadian A.M.C.

Lieut.-Col. F. S. L. Ford, C.M.G., Canadian A.M.C., to be Assistant Director of Medical Services, and to be temporary Colonel whilst so employed, vice Col. A. E. Ross, C.M.G., Canadian A.M.C.

Capt. G. H. R. Gibson, Canadian A.M.C., vice Lieut.-Col. F. S. L. Ford, C.M.G., Canadian A.M.C., and Lieut.-Col. C. P. Templeton, Canadian A.M.C., to be Deputy Assistant Directors of Medical Services.

Lieut.-Col. Cecil A. Lane, R.A.M.C., from Supernumerary List, to be Colonel.

ROYAL ARMY MEDICAL CORPS.

Major D. P. Kappele, Canadian A.M.C., to be temporary Lieutenant-Colonel whilst holding appointment as Officer Commanding, Canadian Cavalry Field Ambulance.

J. Macpherson to be temporary Honorary Lieutenant-Colonel.

Temp. Hon. Capt. C. McNeil to be temporary Honorary Major whilst serving with the Scottish Red Cross Society.

Capt. H. Meggitt to be Major.

To be temporary Majors: Temp. Capts. A. E. H. Bennett, R. H. MacDonald, C. J. Marsh, W. H. Whitehouse, G. G. Greer.

Lieut. W. Brander is restored to the Establishment.

Major (temp. Lieut.-Col.) R. Corfe relinquishes his temporary rank on ceasing to command a field ambulance.

Major J. R. Williams relinquishes his commission on account of ill-health, and is granted permission to retain his rank and wear the prescribed uniform.

Capt. G. D. Freer relinquishes his commission on account of ill-health.

Temp. Capt. A. R. Taylor, Canadian A.M.C., resigns his temporary commission.

Temp. Capt. J. Brereton-Barry relinquishes his commission on account of ill-health.

SPECIAL RESERVE OF OFFICERS.

Capt. (temp. Major) W. M. Parham relinquishes his temporary rank on alteration in posting.

Lieutenants to be Captains: P. N. Cook, H. M. C. Macaulay.

To be Lieutenants: A. D. Gorman (from Glasgow University Contingent O.T.C.), A. H. Boon, R. McGregor.

TERRITORIAL FORCE.

Captains to be temporary Majors: D. Douglas Crawford, J. Hay.

Lieutenants to be Captains: L. A. Williams, M. B. G. Sinnette, H. Vallow.

Temp. Capt. J. J. O'Neill relinquishes his commission.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon the undermentioned officers of the Territorial Force, R.A.M.C.: Major A. Butler, Major A. C. Hartley, Lieut.-Col. W. G. Richardson, Major (temp. Lieut.-Col.) G. A. Troup, Major (temp. Lieut.-Col.) A. W. Anderson, Major R. B. Sidebottom (attached Cheshire Regiment), Major R. Brodie (attached Seaforth Highlanders), and Major Peter Paget (attached East Kent Regiment).

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

In the May number of the *Journal of the Royal Army Medical Corps* Colonel Andrew Fullerton, C.M.G., has a useful article on Injuries of the Bladder and Urethra in War, these lesions having received very little attention on the part of writers on military surgery during the present war; and Colonel Cuthbert S. Wallace, C.M.G., discusses the treatment of Gas Gangrene as seen at the Casualty Clearing Stations. While it is true that the disease is not so dangerous now as it used to be, because of the universal opening-up of wounds, the amount of trouble that it entails, and the amount of disturbance that it is necessary to inflict on a grievously wounded patient, makes the author of the communication long for some remedy other than surgical interference. With the object of showing the frequency and nature of the diseases of the ear, throat and nose met with in a T.F. General Hospital Captain A. Brown Kelly contributes an article on statistics of the first 1000 of these diseases treated in the Fourth General Hospital, Stobhill, Glasgow, and Lieutenant-Colonel C. M. Wenyon and Captain F. W. O'Connor continue their joint inquiry into problems affecting the spread and incidence of intestinal protozoal infections of British troops and natives in Egypt.

THE LATE DR. C. E. TODD, OF ADELAIDE.—Charles Edward Todd, M.R.C.S. Eng., M.D. Brux., whose death at Adelaide is announced, was son of the late Sir Charles Todd, F.R.S., and received his medical education at St. George's Hospital, qualifying in 1882. Going out to Australia, he became surgeon to the Adelaide Hospital and to the South Australian Police Department, and was one of the best known operators in Australia. From 1901–2 he was president of the South Australian branch of the British Medical Association, and he held a commission as justice of the peace.

Medical News.

UNIVERSITY OF LONDON.—The Appointments Board was constituted by the Senate in 1909 for the purpose of assisting graduates and students of the University to secure appointments. About 2500 graduates and students have up to the present taken advantage of the Board's organisation, and a considerable proportion of them have secured appointments through its agency. The war has naturally impeded its general work, though not its usefulness. It is believed that after the war there will be much greater opportunities of successful work. Special efforts will be made to meet the employment needs of students and graduates who have served in the Army and Navy, and who may be temporarily displaced. All such graduates are invited to send their names to the secretary at once. The offices are at the University, South Kensington, S.W. 7.

THE LOCAL GOVERNMENT BOARD OF IRELAND AND DOCTORS OF MILITARY AGE.—The legality of the attitude of the Local Government Board, Ireland, in refusing to sanction the appointment to Poor-law offices of medical men of military age will shortly come before the courts for decision. A conditional order of mandamus was granted recently by the King's Bench on behalf of the Rathdown guardians, directing the Local Government Board to exercise their discretionary power of sanctioning the appointment of Dr. D. Boland to the position of medical officer. Sanction had been refused on the ground that the doctor was of military age, and the guardians submitted that there was no power of refusal when a man was qualified for the appointment. Several other boards are awaiting the decision in this case.

CENTENARIAN.—The King has sent a letter of congratulation to Mrs. Clutten, of Bungay, Suffolk, who has celebrated the 100th anniversary of her birthday.

THE office of the Assistant Director of Medical Service for the London Area of the Overseas Military Forces of Canada has been changed from 76, Strand, W.C. 2, to 13, Berners-street, W. 1.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The annual election of honorary officers and Council of the Royal College of Surgeons in Ireland took place on June 4th. There was no change either in the officers or in the members of Council. Lieutenant-Colonel William Taylor therefore now enters on his second year of office as President.

THE DENTISTS' REGISTER.—The official register for 1917 contains the names of 5512 dentists, of whom 11 are on the colonial and 16 on the foreign list. Of the 5485 United Kingdom dentists, 4134 hold licences in dental surgery, and 1351 are registered on their own declaration of being in bona-fide practice of dentistry. Of the former, 462 have additional surgical or medical qualifications, of the latter 7. The number added by registration during the year 1916 was 195, 8 were restored to the Register, and 144 were removed—120 on evidence of death, 0 on ceasing to practise, 23 under Section XII., and 1 under Section XIII. of the Dentists Act, 1878.

DEATH OF THE INVENTOR OF THE SIMPSON LAMP.—The death is announced on Tuesday, June 5th, of Mr. William Speirs Simpson, civil engineer, the inventor of the lamp which bears his name. The applications of this lamp in therapeutic practice were described in THE LANCET of Jan. 8th, 1916, p. 76, Jan. 29th, 1916, p. 240, Feb. 19th, 1916, p. 405, and March 4th, 1916, p. 508. The observations seem to prove that this lamp is not capable of producing penetrative rays but intensely actinic rays, which effect a marked destructive influence on bacteria. The poles of this arc lamp consist of wolframite, a tungsten compound, and the rays so produced are much more powerful than those given by the electrodes of the original Finsen lamp.

DONATIONS AND BEQUESTS.—Mr. and Mrs. G. W. Hayes, of Chester, have given £17,000 to Chester Infirmary for the purpose of endowing a ward in memory of their son, who was killed in action.—By the will of the late Mr. James Bruce, D.L., J.P., of Thorndale, Belfast, the testator left £1000 each to the Belfast Royal Hospital and the Society for Providing Nurses for the Sick Poor, Belfast; £500 each to the Belfast Nurses' Home and Training School, the Belfast Maternity Hospital, the Belfast Hospital for Sick Children, and the Belfast Consumption Hospital.—Miss M. E. P. Elliott, of Devonport, has bequeathed £2000 to Dr. Hingston's Convalescent Home at Devonport, and £500 to Dr. Hingston's Deaf and Dumb Institution, £1000 to the Plymouth Eye Infirmary, and £300 to the South Devon and East Cornwall Hospital, Plymouth.

HOSPITAL SATURDAY IN BELFAST.—The collection on Saturday, June 2nd, for the Royal Victoria Hospital, Belfast, has already realised £1512; and when all the outlying districts have made their returns the total is expected to reach at least £1700, which is the largest amount ever obtained.

ROYAL SANITARY INSTITUTE (90, BUCKINGHAM PALACE-ROAD, S.W.).—The next sessional meeting will be held at the Town Hall, Weston-super-Mare, on Saturday, June 30th, at 11.30 A.M., when Dr. W. G. Savage (medical officer of health for Somerset) will open a discussion on "Meat Inspection in Rural Districts." Dr. W. J. Howarth will be in the chair.

BENN ULSTER EYE, EAR, AND THROAT HOSPITAL, BELFAST.—At the annual meeting of subscribers to this hospital held on May 31st it was reported that during the past year there were 1560 new extern patients, while 470 were admitted to the wards. Five of the members of the medical staff have been granted commissions. The financial condition of the institution was sound, though it was stated that less than one-sixth of the income of the hospital was received from the public.

NATIONAL DENTAL AID FUND.—On Tuesday, June 12th, at the Mansion House, the Lord Mayor presided at a meeting of this fund, which is really an extension of the Soldiers' and Sailors' Dental Aid Fund. The movement, which is known as the Ivory Cross, will now give dental aid to discharged service men, the home army, the mercantile marine, and the necessitous poor. It has the support of the dental profession, and letters of approval were read at the meeting from, amongst others, Sir Arthur Newsholme (Medical Officer, Local Government Board), Sir StClair Thomson, M.D., Mr. W. H. Dolamore (President, British Dental Association), and Mr. W. Francis Mellersh (President, Metropolitan Branch, British Dental Association). The temporary offices of the fund are 10, Conduit-street, W. 1.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Parliamentary Session.

Both Houses of Parliament have now resumed after the Whitsun Recess.

HOUSE OF COMMONS.

THURSDAY, JUNE 7TH.

American Medical Men in France.

Sir GEORGE GREENWOOD asked the Under Secretary for War whether a large number of American doctors had recently been sent, by arrangement with the British Government, to treat British wounded soldiers in France; whether the American degrees of such doctors had been recognised for this purpose; whether he was aware that American osteopathic doctors held similar degrees and diplomas to those held by the doctors so sent to treat British wounded in France and were equally qualified to practise in the United States; and whether, in view of these facts, he would give permission to American osteopathic doctors, duly qualified in America, to attend to and treat British wounded in this country in cases where the patients might so desire.—Mr. MACPHERSON wrote in reply: A large number of doctors commissioned in the Army of the United States have been sent to Europe, and many of the most eminent practitioners in the United States are included. The American Government has commissioned the officers sent, and it is not proposed to look for any other security that these officers are qualified for the duties assigned to them.

Medical Re-examinations.

Answering Mr. JACOBSEN, Mr. MACPHERSON stated that no special or secret instructions had been issued to the Army medical authorities in connexion with re-examinations under the Military Service (Review of Exceptions) Act beyond those which had already been placed in the Library of the House of Commons.

Sterilised Meat.

Mr. FIELD asked the Secretary to the Local Government Board, in view of the fact that continental nations had for many years arranged conditions whereby partially tuberculised meat was sterilised, marked, and sold at a cheaper rate with benefit to the working consumers, whether he would make similar arrangements so that the meat food-supply might be fully availed of.—Mr. HAYES FISHER answered: I am in communication with the Ministry of Food with regard to this subject.

FRIDAY, JUNE 8TH.

Exchange of Prisoners.

Answering Mr. HUME-WILLIAMS, who asked whether an agreement had been entered into between France and Germany for the mutual repatriation of prisoners interned in Switzerland, and whether negotiations were pending for the conclusion of a similar agreement between this country and Germany, Mr. J. F. HOPE (representing the War Prisoners' Department) said: The answer to the first part of the question is in the affirmative. The agreement relates to prisoners of war who are found by a Swiss Medical Commission to be totally unfit for military service. The decision of this commission must, however, be confirmed by another commission of one military and two medical officers appointed by the captor Governments. An agreement has been concluded between H.M. Government and the German Government on similar lines. This agreement is not yet actually operative so far as we know. I should explain that the number of British prisoners of war who will benefit by the agreement is not likely to be considerable, and that a few men have already been repatriated from Switzerland on the ground that their health has deteriorated to such an extent since their transfer from Germany as to make them eligible for repatriation under the repatriation agreement already existing with Germany.

Mr. HUME-WILLIAMS: How soon will the agreement become actually operative?—Mr. J. F. HOPE: I imagine at once.

Mr. HUME-WILLIAMS asked whether any British and Turkish prisoners had yet been exchanged.—Mr. J. F. HOPE replied: No exchange of British and Turkish prisoners of war has yet taken place, nor, unfortunately, is it likely that any can take place in the immediate future. In a note which has just reached H.M. Government, after a delay of over two months, the Turkish Government pass over the proposals made to them for the exchange of 100 or 600 invalid prisoners a side as a first instalment and express the desire to revert to the arrangement reached last year, according to which all prisoners were to be exchanged who came up to a certain standard of incapacity. As it appears that the Ottoman Government only considers that 11 of the British prisoners of war who were in their hands in December last reach that standard it is clear that such an arrangement would prove wholly unsatisfactory. The Turkish Government is, therefore, now being pressed for a specific reply to the above-mentioned proposals for numerical exchange.

Sir J. JARDINE: Does the answer refer merely to British prisoners, or does it include Indians?—Mr. J. F. HOPE: Speaking from memory, I think it includes both.

Replying to a further question by Mr. HUME-WILLIAMS, Mr. J. F. HOPE stated that the United States Ambassador had left Constantinople, and the protection of British interests in Turkey was now in the hands of the Netherlands Minister. The United States Ambassador was not able, so far as was at present known, to take advantage, before leaving, of the promised permission to cause internment camps to be visited by his representatives. The Netherlands Minister had been requested to cause the camps to be visited, but it was not known whether he had been able to do so, and no reports had yet been received.

The Supply of Flavine.

General CROFT asked the Under Secretary for War (1) whether the properties of flavine were known to the medical profession in January last when a preliminary report was published in the *British Medical Journal*, and whether up to this time substantial quantities of flavine could not be obtained for the treatment of wounded soldiers in any hospital either at home or abroad; and (2) whether the War Office had received information as to the properties of the new antiseptic flavine; if so, what steps had been taken to obtain it; to whom was the order given for the supply of flavine and within what time was the order executed; whether there had been any delay in the execution of this order; and, if so, what was the reason.—Mr. MACPHERSON answered: The antiseptic properties of the substance referred to were described in a preliminary report published in the medical press in January last, giving the results of experiments with a small supply of this complex substance, specially made for these experimental purposes in a Government laboratory. Arrangements were made at the time for further trials in various military and other hospitals, and steps were taken with a view to a commercial supply being made available in the event of these trials proving sufficiently favourable. The trials had been in progress since January and the effects so far obtained are under careful comparison with those of other antiseptics. Before the substance can be placed on the market a licence must be obtained from the Board of Trade, as the substance was already the subject of a patent obtained before the war. Applications were made to the Board of Trade by various firms in the middle of last month. The hearing took place on May 24th, and I am informed that

the requisite licences are now being issued to five firms. There would therefore seem to be no doubt that the supply of the substance will be made available as rapidly as the several firms can produce it.

Medical Examinations for the Army.

Mr. ANDERSON asked the Under Secretary for War whether he was aware that statements of so serious a character regarding the treatment of men sent back for medical re-examination had been made before the Northampton tribunal that it had been agreed to hold a special joint meeting with representatives of the Medical Board; whether he knew that one solicitor stated that his clients had been treated like dogs; and whether investigations into these charges would be made by his department.—Mr. MACPHERSON replied: No specific complaints of the treatment by the Northampton Recruiting Medical Board have been received in the War Office. An officer of the department recently visited the Board and found that the men were being well treated and carefully examined. If my honourable friend will give me details of any particular case of alleged ill-treatment, I will have the matter investigated immediately.

Mr. RAMSAY MACDONALD asked the honourable gentleman whether his attention had been called to the passing for active and other forms of military service involving hard physical labour of men in Leicester suffering from valvular disease of the heart, chronic rheumatism, blindness in one eye, congenital physical weakness which had incapacitated from work for years, curvature of the spine, lameness, chronic bronchitis, and similar complaints; and whether he proposed to issue instructions to the Army doctors examining in Leicester which would prevent them passing such men into the Army.—Mr. MACPHERSON said in reply: I have noted what my honourable friend says of the Recruiting Medical Board at Leicester, but I must remind him that men suffering from definite disabilities which incapacitate them for general service are being classified in the lower categories for service of an auxiliary character. Every endeavour is made not to accept for service men whose disabilities are of such a character as to unfit them for rendering military service either of a general or an auxiliary character.

Mr. PRINGLE: Is the honourable gentleman aware that men are passed into low categories and then are immediately, on subsequent examination, passed into higher categories without any real examination of their physical condition?—Mr. MACPHERSON: I am told that is not the case.

Mr. PRINGLE: It is universal.

Mr. RAMSAY MACDONALD: Is it not a fact that men passed into the lower classes of these categories have got notice to sell up their businesses and dispose of what connexion they have got, and that the mere passing of the medical examination is so serious that it ought not to be done unless it means something from a military point of view?—Mr. MACPHERSON: I am told that no special instructions to give any such notice have been given by the War Office.

Mr. PRINGLE: Can the honourable gentleman explain why the R.A.M.C. doctors pass men without putting the stethoscope to them, especially seeing that the men have been certified to be suffering from valvular disease of the heart?—Mr. MACPHERSON: The honourable Member has made these charges previously, but he has not once submitted a specific case.

Mr. PRINGLE: I have.

Mr. MACPHERSON: I may inform the House that within the last week the Director-General has visited various centres from which complaints have come, and I can assure the House that thorough investigation of each complaint is being made.

Mr. PRINGLE: Whitehall is one of them.

Mr. RAMSAY MACDONALD: Has my honourable friend inquired into the long list of specific cases which I sent to him the other day, with names, addresses, and particulars of the men about whom I have made complaints?—Mr. MACPHERSON: Yes, I have ordered inquiries to be made into each individual case.

Answering Mr. CHANCELLOR, Mr. MACPHERSON said that it was not the policy of the War Office to enlist men for any form of service for which they were medically unfit.

MONDAY, JUNE 11TH.

Health of Troops in Mesopotamia.

Replying to Sir J. JARDINE, Mr. MACPHERSON (Under Secretary for War) wrote: The general health of the whole British Forces in Mesopotamia is satisfactory. There is an ample supply of hospitals, and no deficiency of nurses has been reported. The ratio of admission to hospital is less than double that of the troops in India in peace-time. The death-rate for all causes other than wounds in action is 4·5 per 1000 per annum, which is only fractionally higher than the peace rate in India. Owing to the arrangements made to induce local cultivators to grow crops under our control, it is reported that full and varied supplies of vegetables can now be obtained throughout the year at all the principal centres.

Medical Examinations for the Army.

Mr. NEEDHAM asked the Under Secretary for War whether men who had been discharged on account of valvular disease of the heart were entitled to claim to be totally or permanently disabled in accordance with the Military Service (Review of Exceptions) Act, 1917.—Mr. MACPHERSON replied: The answer is in the negative.

Mr. NEEDHAM asked whether the honourable Member would arrange in the case of men called up for re-examination under the Military Service (Review of Exceptions) Act the examining medical board should be supplied with the man's medical history of his service in the Army.—Mr. MACPHERSON answered: Instructions have already been issued reminding recruiting officers of the necessity of obtaining the previous documents of discharged soldiers.

Mr. PRINGLE: Will my honourable friend issue instructions that the medical history of the examined men shall be considered, because the documents are simply put aside?—Mr. MACPHERSON: I will have that inquired into.

TUESDAY, JUNE 12TH.

"Manipulative" Surgery.

Mr. PETO asked the Under Secretary for War whether he was aware that the deputation of the Parliamentary Injured Soldiers' Committee was informed by the Secretary of State for War on May 8th that he would consult the Law Officers of the Crown as to the acceptance of the offer of Mr Barker and other manipulative surgeons to give free treatment to injured soldiers; and whether he had received this information and could communicate it to the House.—Mr. MACPHERSON replied: The Law Officers have not yet given their opinion on the points submitted to them.

Mr. PETO: Will the honourable gentleman take some steps to get an early decision in this matter, seeing that a great interest is taken in it by 300 Members in this House?—Mr. MACPHERSON: I have asked that it should be expedited.

WEDNESDAY, JUNE 13TH.

Medical Arrangements in Mesopotamia.

Answering several honourable Members who asked when the report of the Mesopotamia Commission and the report made by Sir William Vincent's Commission on medical arrangements there would be published, Mr. BONAR LAW (Chancellor of the Exchequer) said: The report of the Mesopotamia Commission, which includes Sir W. Vincent's report, will be published immediately without alteration.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

HICKS, CHARLES E., M.R.C.S., L.R.C.P., has been appointed Medical Officer and Public Vaccinator to the Godmanchester District of the Huntingdon Union.

RIVERS, C., Certifying Surgeon under the Factory and Workshop Acts for the Redruth district of the county of Cornwall.

SALT, A. P., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Totnes district of the county of Devon.

SIMPSON, J. W., M.D., F.R.C.P. Edin., to be one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Sheriffdom of The Lothians and Peebles.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BODMIN, CORNWALL COUNTY ASYLUM.—Female Junior Assistant Medical Officer. Salary £200 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—House Surgeon.

ENFIELD, ROYAL SMALL ARMS FACTORY.—Assistant Medical Officer. Salary £438 per annum.

ESSEX COUNTY COUNCIL.—Assistant Tuberculosis Officer for holiday season. Salary £30 a month.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician. Salary at rate of £160 per annum, with board, &c. Also Clinical Assistant in Out-patient Departments.

FARNWORTH, NEAR BOLTON, TOWNLEYS MILITARY HOSPITAL. Female Assistant Medical Officer. Salary £383 5s. per annum, with rations, &c.

FOLKESTONE, ROYAL VICTORIA HOSPITAL.—Resident Medical Officer. Salary £100 per annum, with board, &c

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

HAWKHEAD ASYLUM, Cardonald, Glasgow.—Senior Assistant Medical Officer. Salary £360, with board, &c. Also Junior or Temporary Assistant.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 40, Grove End-road, N.W.—Resident Medical Officer.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £100 per annum.

MIDDLESBROUGH, NORTH ORMESBY HOSPITAL.—Assistant to House Surgeon. Salary at rate of £100 per annum, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female House Physician, Obstetric Assistant, Two House Surgeons. Salary £50 per annum, with board, &c. Also Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum.

OLDHAM ROYAL INFIRMARY.—Third House Surgeon. Salary £225 per annum, with board, &c.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £200 per annum, with board, &c.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Honorary Assistant Surgeon to Ear, Nose, and Throat Department.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician for six months. Salary £100 per annum, with board, &c. Also Temporary Assistant Physician Wednesday afternoons to see Out-patients. Lunch provided and travelling expenses.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

SALFORD ROYAL HOSPITAL.—Junior House Surgeon. Salary at rate of £150 per annum, with board, &c.

SALFORD UNION INFIRMARY, Hope, Pendleton, near Manchester.—Female Assistant Resident Medical Officer. Salary £250 per annum, with rations, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SHEFFIELD UNION HOSPITAL, Firvale.—Female Resident Assistant Medical Officer. Salary £250 per annum, with rations, &c.

SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £200 per annum, with board, &c.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Evening Clinic for Venereal Diseases. Clinical Assistants.

WESTMORLAND CONSUMPTION SANATORIUM AND HOME, Meathop, Grange-over-Sands.—Assistant Medical Officer. Salary £300 per annum, with board, &c.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Medical Officer to take charge of Out-patient Department. Salary £250 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Bromley, Lisnaskea, and St. Agnes.

Births, Marriages, and Deaths.

BIRTHS.

BADGEROW.—On June 7th, at Hill-street, Knightsbridge, the wife of Major George W. Badgerow, F.R.C.S., Harley-street, W., of a daughter.

HILL.—On June 7th, at a nursing home, the wife of J. Percival Hill, M.A., M.D., of a daughter.

WELLS.—On June 6th, at Orleans Lodge, Winchmore-hill, N., the wife of Arthur G. Wells, M.B., B.S., D.P.H., M.R.C.S., L.R.C.P., Barrister-at-Law, of a son.

MARRIAGES.

DENNIS—CASSWELL.—On June 5th, at St. Mary's, Battersea, Captain Arthur Wesley Dennis, R.A.M.C., to Mary Theodora, eldest daughter of George Casswell, Gosberton, Lincs.

DICKSON—CUNNINGHAM.—On June 5th, at St. George's U.F. Church, Edinburgh, Captain Robert Milne Dickson, R.A.M.C., to Kate Wilson, daughter of the late William Cunningham, Dundee, and Mrs Cunningham, Merchiston Bank-gardens, Edinburgh.

FULLER—O'DONNELL.—On June 4th, at the Oratory of the Sacred Heart, Bournemouth, Captain R. Annesley Fuller, M.C., R.A.M.C., to Madeleine Mary, younger daughter of the late W. M. O'Donnell, F.R.C.S., of Glenreigh, Tipperary.

KEMP—DAVEY.—On June 6th, at Hampstead Parish Church, Charles Gordon Kemp, M.C., M.D., temp. Captain, R.A.M.C., to Kathleen Emily Davey, niece of Colonel J. and Mrs. Stollery, Hove.

WILLS—CROOK.—On June 7th, at Marlow Parish Church, Lieutenant Francis H. P. Wills, R.A.M.C., to Dorothy, eldest daughter of the late Peter Crook and of Mrs. Crook, of Borwick Lodge, Ambleside.

DEATHS.

BURN.—On June 7th, at Beechwood, Upper Tooting, S.W., William Barnett Burn, M.D. Lond., B.Sc. Lond., M.R.C.S., L.S.A., F.R.M.S., aged 73.

THORNE.—On June 11th, after a short illness, William Bezly Thorne, M.D., of Harley-street, W.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE BRITISH WOMEN'S HOSPITAL COMMITTEE.—This committee has forwarded to the Scottish Women's Hospitals a cheque for £10,000, which includes the profits of the season of *The Passing of the Third Floor Back*. The same committee has also given £500 to the Royal College of Nursing and £500 to the Hampstead and North-West London Hospital.

Notes, Short Comments, and Answers to Correspondents.

CURIOUS TOPOGRAPHICAL NAMES.

To the Editor of THE LANCET.

SIR,—We are becoming daily more familiar with many curious names of places and it is interesting to watch any which have a medical significance. The following is a little collection of names of altitudes and lakes in Canada which has some interest and arouses speculation as to their origin, and in some cases appear to reflect the influence of medical matters on the minds of people who likened places to medical fancies. In Alberta: Chin Hill, Knee hills, Medicine Lodge hills, Sulphur Mountain. In Assiniboia: Medicine Hat, Old-man-on-his-back plateau. In Athabaska: Knee Lake. In British Columbia: Bald Mountain, Eliza Ears, Face Mountain, False Ears, Family Humps, Finger Mountain, Golden Ears Mount, Heart Mountain, Nipple Summit, Nose Peak, Stone Nipples, Three Finger Peak, Thumb Peak. In Keewatin: Medicine Stone Lake, Woman Lake. In Manitoba: Bone Lake. In Ontario: Elbow Lake. In Quebec: Hair-cutting Lake, Tongue Lake. There are post-offices in Canada of the following names: Asbestos, Brown's Nurseries, Cap Santé, Elbow River, Eyebrow Hill, Finger Board, Gros Ventre (Assiniboia West), Hemlock, Henry's Corners, Heal, Mouth of St. Francis, North Gut, Science Hill, Skull Creek, Soda Lake, Sulphur, Thigh Hill, Tongue Creek.

In names familiar in connexion with the war Canada is rich, for there are Vienna, Berlin, Paris, London, and Bruxelles, Verdun and Namur, Flanders, Baltic, and Libau, Lemberg, Metz, and Krakow, Alsace and Lorraine, Lille and Amiens, Dieppe and Boulogne, four "French Villages," and three "French Rivers." There are Aldershot and Chatham, Dover and Harwich, Greenwich, Gosport, and Gibraltar, Egypte and Cairo, and Garden of Eden (near Tigris and Euphrates), while a prophetic instinct was shown ten years ago at least in the naming of Kaiser, Hun's Valley, and Gas Line, with Tanks (hill) 24 feet high in Prince Edward Island, and Marconi, not to mention "Round Up" and "New Germany." As a reminder of previous wars Canada has Mafeking, Ladysmith, Kimberley, Majuba Hill, Balaclava and Alma, Lucknow, Bannockburn, Waterloo, Trafalgar, Second Peninsula, while Nelson and Wellington and Washington are there with Collingwood, Havelock and Buller. Kitchener and French are there and a "Victoria Cross." Jeanne d'Arc, Bismark, and Moltke are there with Agricola and Germanicus. Asquith, Balfour, Earl Grey, and Carson are included. There is a psychology in names and I think the above will show some evidence of it.

I am, Sir, yours faithfully,

London, June 6th, 1917. ONOMATOLOGIST.

CAMPHORATED VASELINE OIL.

OWING to the fact that liquid vaseline is easier to sterilise than olive oil, certain French pharmacists have been tempted to utilise it in the preparation of camphorated oil. The substitution is not always devoid of consequences. Several instances were recently brought before the Paris Surgical Society of extensive and obstinate indurations which had resulted from injections of *soi disant* camphorated oil. In every instance inquiry elicited the fact that vaseline oil had been used in the preparation. Histological examination showed the indurations to consist in the main of inflammatory tissue containing numerous polynuclear cells. Physicians should not be tempted to prescribe, or dispensing chemists to substitute, liquid vaseline oil for the more assimilable vegetable oil.

PLAGUE AMONG RATS IN AN INDIAN ASYLUM.

Colonel W. H. B. Robinson, I.M.S., in his report for 1916 on the Lunatic Asylum at Nagpur (Central Provinces), gives credit to the work of a deputy superintendent, to whose administration he ascribes the fact that, though plague was raging all round and rats were dying all over the asylum, none of the inmates were attacked.

MEDICAL BARONETCIES.

To the Editor of THE LANCET.

SIR,—It may interest certain readers of THE LANCET to know that Dr. Frederick Taylor is the ninety-fourth member of the medical profession to receive the honour of the baronetcy. King James I., at the institution of the Order in 1611, offered the first patent to his physician, Dr. Henry Atkins. Dr. Atkins, however, refused the honour, probably on account of an onerous condition attached to it at that time—namely, the maintenance for three years in the province of Ulster of 30 soldiers. The premier medical

baronet was Sir Edward Greaves, so created in 1645 by Charles I., to whom Dr. Greaves was physician-in-ordinary.

The number of medical baronets created by succeeding monarchs is as follows: By Charles II., 5; by George I., 1; by George II., 2; by George III., 17; by George IV., 5; by William IV., 5; by Victoria, 38; by Edward VII., 11; by George V., 9. "Jacobite Baronetcies" were conferred by "James III." upon two of his medical adherents. Inherited baronetcies have been held by 19 medical men.

I am, Sir, yours faithfully,

S. D. CLIPPINGDALE.

Holland Park Avenue, W., June 9th, 1917.

A QUAINT RHYMING CIRCULAR.

THE following extract from the *New York Packet* of Oct. 11th, 1784, is an interesting memento of the time when rhyming circulars and catalogues were issued—an accomplishment almost impossible now, we should imagine, with the multiplicity of sesquipedalian terms:—

At the Medical Pillar, corner of Wall street and Hanover-square, head of the Coffee-house bridge, Smith, Moore & Co. have for sale, a general Collection of the Materia Medica, Botanical, Clynical and Galenical.

Produc'd from field, from fire, and pot, [and root,
Each compound, mineral herb,
Radex Colomb; Glyz: Gent: Valerian;
Cortex Semarub: Winterian;
Rochelle and Glauber's salts, and shell Lac;
Gums of Greek name and Arabac,
Galb: Kino: and Opoponax,
Opium, Juniper, and Styrax,
Camphor, Tbus, Aloes, Guaiac,
Myrrh, Gamboge, Scammony, Ammoniac; [you'll find
Fine flowers of Su'phur: here
The red Bark too of purest kind;
Magnesia, Allum, Cream of Tart,
Tamarinds, Coral, and Sal Mart:
Syrups and Extracts, Seeds and Senna, [Manna,
Musk, Saffron superfine, and
Caraway, Fennel, Spanish Flies,
Cam'mile, Cinnabers, and Crab's-eyes, [white,
Best leathern skins, the red and
And Candied-sugar brown and light;
Figs, Sago, Salop, and Tin-foil,
Pearl-barley, Starch, and Olive Oil,
Spice, Raisins, Currants, Surgeon's tow, Wax,
Salt-petre, Bismuth, Potash, Borax,
Green oil-cloth, Sponge, Alleppo-galls, [balls,
Corks, Acqua Fort: Zinc: Liqu'rice
Balsam Canadian, and Tolu,
Caplvi, Gilead, and Peru,
The purest Æther, Eau du Luce,
Liquor by Hoffman, Lemon Juice,
Isinglass, and Hartshorne shavings,
To clear your coffee or wine-leavings, [Viv.
Strong Oil of Bays, and Argent.
For Hessian vermin left alive.

THE SALICYLIC TREATMENT OF RHEUMATISM.

To the Editor of THE LANCET.

SIR,—Being surgeon in charge of H.M.S. *Salamander* off the north coast of Australia, Surveying Service, in 1862, I had a case of acute rheumatism and, being a thousand miles from a drug-store, I wanted to prescribe quinine but found we were out of it and had only, casually, a bottle of salicin, then hardly used in medicine. This I administered with good results. I think I must have been thus the discoverer of the salicylic treatment of rheumatism.

Perhaps some curious reader might enlighten me, as I think it was the first instance of that great anti-rheumatic remedy being used.—I am, Sir, yours faithfully,

Valparaiso, Chili, April 26th, 1917. RICHARD CANNON, M.D.

*** The late Dr. T. Maclagan stated (THE LANCET, 1876, i., 342) that the idea of treating acute rheumatism with salicin occurred to him in November, 1874.—ED. L.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETING OF SECTION.

Thursday, June 21st.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac): at 5 P.M.
Cases (at 4.30 P.M.).

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C. 2.
TUESDAY.—4.30 P.M., Annual Meeting. Election of Officers and Council. Clinical Cases will be shown by Capt. Underwood, R.A.M.C., Capt. W. Griffith, R.A.M.C., Dr. J. L. Bunch, Dr. W. K. Sibley, Dr. G. P. Mitchell, and Dr. M. Dockrell.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital, Hammersmith-road, W.
FRIDAY.—8 P.M., Reception. 8.15 P.M., Cavendish Lecture:—Capt. A. Macphail, C.A.M.C.: A Day's Work. Annual Conversazione.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.
TUESDAY AND THURSDAY.—5 P.M., Croonian Lectures:—Lieut.-Col. J. G. Adami, A.D.M.S.: Adaptation and Disease. (Lectures II. and III.)

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. B. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).
WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture X.:—Dr. E. J. Russell: Food Production in Peace and War. Followed by a discussion.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

We cannot undertake to return MSS. not used.

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MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

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WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, June 13th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
June 7	0·04	129	81	59	64	68	Cloudy
,, 8	...	99	73	57	61	68	Fine
,, 9	...	115	77	58	61	68	Fine
,, 10	...	113	76	54	55	64	Cloudy
,, 11	...	124	82	56	58	64	Fine
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Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LIMITED, London.
Economic Conditions, 1815 and 1914. By H. R. Hodges, B.Sc. 2s. 6d. net.
After-War Problems. By the Earl of Cromer, Viscount Haldane, the Bishop of Exeter, Professor Alfred Marshall, and Others. Edited by William Harbutt Dawson. 7s. 6d. net.

BAILLIÈRE, TINDALL, AND COX, London.
Anæsthetics: A Practical Handbook. By J. Blomfield, M.D. Cantab. Fourth edition. 4s. net.
Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods. By Reginald Hayes, M.R.C.S. Second edition, revised. 5s. net.
Handbook of Anatomy for Students of Massage. By Margaret E. Björkegren, Inter. (M.B.) Lond. Second edition. 5s. net.
Physical Remedies for Disabled Soldiers. By R. Fortescue Fox, M.D., and Others. 7s. 6d. net.

CAMBRIDGE UNIVERSITY PRESS.
Causes of Tuberculosis, together with Some Account of the Prevalence and Distribution of the Disease. By Louis Cobbett, M.D., F.R.C.S. 21s. net.

CLARENDON PRESS, THE, Oxford. (HUMPHREY MILFORD, London.)
Three Lectures on Experimental Embryology. By J. W. Jenkinson, M.A., D.Sc., sometime University Lecturer in Embryology and Fellow of Exeter College, Oxford. With a Biographical Note by R. R. Marett, M.A., D.Sc. 7s. 6d. net.

METHUEN AND CO., London.
A Psychic Vigil in Three Watches. Anonymous. New edition. 5s. net.

MURRAY, JOHN, London.
The Transactions of Lord Louis Lewis. By Roland Pertwee. 5s. net.

UNWIN, T. FISHER, LIMITED, London.
How to Become a Dispenser: The New Profession for Women. By Emily L. B. Forster. 2s. 6d. net.

WHITE AND CO., F. V., London.
Fresh Hope and Health for Wounded and Disabled Soldiers. By Cecilie Muller. 1s. net.

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